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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME XIII

1899 - 1900

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OFFICERS AND COUNCIL

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For 1899.

(ELECTED DECEMBER 17, 1898)

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* Ex-Presidents of the Society.

OFFICERS AND COUNCIL

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

For 1900

(ELECTED DECEMBER 30, 1899)

OFFICERS

President

FREDERICK V. COVILLE

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STANDING COMMITTEES—1900

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*Ex-Presidents of the Society.

VOL. XIII, PP. IX-XX MARCH 9, 1901

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

The Society meets in the Assembly Hall of the Cosmos Club on alternate Saturdays at 8 p. m. Brief notices of the meetings, with abstracts of the papers, are published in *Science*.

January 14, 1899—300th Meeting.

The President in the chair and 32 persons present.

W. H. Ashmead exhibited specimens of *Chirodamus*, a rare South American wasp, three specimens of which had been found in a collection presented to the National Museum by the U. S. Fish Commission.

Vernon Bailey described an interesting case of protective coloration in *Ochotona.*

C. L. Pollard exhibited photographs of the laboratory buildings of the New York Botanical Garden in course of erection.

V. K. Chesnut exhibited photographs and fruits of the California laurel (*Umbellularia californica*), a plant belonging to the olive family, the leaves of which contain a volatile oil which is distilled and used for medicinal purposes. The fruits are greatly valued by the Indians as an article of food.

The following communications were presented:

C. L. Marlatt: A New Nomenclature of the Broods of the Periodical Cicada.*

---

*Bull. No. 18, New Series, Division of Entomology, U. S. Dept. of Agr., Nov., 1898, pp. 52-58.

E. A. De Schweinitz: The Practical Working of the Serum Treatment for Swine.*

Erwin F. Smith: The Effect of Acid Media on the Growth of Certain Plant Parasites.†

January 28, 1899—301st Meeting.

The President in the chair and 57 persons present.

The evening was devoted to a symposium upon the topic 'The Great Dismal Swamp', with the following speakers:

David White: Geology and Physiography of the Dismal Swamp.

F. G. Gardner: Soils of the Dismal Swamp.‡

Thomas H. Kearney: The Flora of the Dismal Swamp.§

William Palmer: The Fauna of the Dismal Swamp.

February 11, 1899—302d Meeting.

The President in the chair and 13 persons present.

A severe blizzard was in progress and the society adjourned immediately after the reading of the minutes of the preceding meeting.

February 25, 1899—303d Meeting.

The President in the chair and 33 persons present.

H. J. Webber discussed the recent researches of Lawson on *Cobaea scandens* in which a new method of spindle formation is described.

Gen. Sternberg called attention to the falling of leaves of *Magnolia grandiflora* in Washington caused by the recent severe cold.

The evening was devoted to the further discussion of the Dismal Swamp. The following speakers participated: W. H. Seaman, F. D. Gardner, F. V. Coville, William Palmer, Vernon Bailey, A. K. Fisher, M. B. Waite, and Lester F. Ward.

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*The Serum Treatment of Swine Plague and Hog Cholera. Bull. 23 Bureau Animal Industry, U. S. Dept. of Agr., 1899, pp. 1-18.

†To be published as a Bulletin of the Division of Vegetable Physiology and Pathology, U. S. Dept. of Agr.

‡To be published in Contributions U. S. Nat. Herb.

§To be published in Contributions U. S. Nat. Herb.

March 11, 1899—304th Meeting.

The President in the chair and 93 persons present.

The evening was devoted to a lecture by Mr. Robert T. Hill on 'The Natural Aspects of Porto Rico' (illustrated by numerous lantern slides).

March 25, 1899—305th Meeting.

The President in the chair and 39 persons present.

The following communications were presented:

T. S. Palmer: The Danger of Introducing Noxious Animals and Birds.*

M. B. Waite: The Effects of the Recent Severe Cold on Vegetation.

F. A. Lucas: The Mental Traits of the Fur-Seal.†

April 8, 1899—306th Meeting.

The President in the chair and 39 persons present.

The following communications were presented:

William Palmer: The Ferns of Hemlock Bluff.‡

O. F. Cook: Notes on the Habits of African Termites.

Erwin F. Smith: Biological Characteristics as a Means of Species Differentiation.

April 22, 1899—307th Meeting.

The President in the chair and 38 persons present.

The following communications were presented:

T. D. A. Cockerell: Faunae and Faunulae of New Mexico.

Oscar Loew: On the fermentation of Tobacco.§

Albert F. Woods: Some Microchemical Reactions resembling Fungi.‖

May 6, 1899—308th Meeting.

In the place of the regular meeting of the Society, a joint meeting with the Chemical Society was held, President Stokes of the Chemical Society presiding, assisted by the President of the Biological Society.

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*Yearbook U. S. Dept. of Agr., 1898, pp. 87-110, figs. 1-6.

†Report of Fur-Seal Investigation of 1896-7, Vol. III, pp. 69-74.

‡The Plant World **2**: 143-149. 1899.

§Report No. 59, U. S. Dept. of Agr.

‖Science n. s. IX, No. 223, pp. 508-510. April 7, 1899.

The evening was devoted to a lecture by Dr. Oscar Loew on 'Tho Function of Mineral Substances in Organisms'* which was followed by ten-minute discussions by H. W. Wiley and Frank Cameron, of the Chemical Society, and A. F. Woods and Erwin F. Smith, of the Biological Society.

May 20, 1899—309th Meeting.

The President in the chair and 37 persons present.

The following communications were presented:

C. Hart Merriam: The Fauna and Flora of Mount Shasta Contrasted with those of the Sierra Nevada and Cascade Ranges.†

Charles L. Pollard: Species Characters among Violets.

Sylvester D. Judd: Birds killed by the Monument during the Night of May 12, 1899.

William Palmer: The evolution of a Subspecies.‡

October 21, 1899—310th Meeting.

The President in the chair and 25 persons present.

The following communications were presented:

O. P. Hay: A Census of North American Fossil Vertebrates.§

V. K. Chesnut: Notes on a Preliminary Catalogue of Plants Poisonous to Stock.‖

Herbert J. Webber: Polyembryony in Citrus Hybrids.¶

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*Bull. No. 18, Division of Vegetable Physiology and Pathology U. S. Dept. of Agr.

†The Boreal Fauna and Flora of Shasta contrasted with Corresponding Faunas and Floras of the Sierra and the Cascades. N. Am. Fauna No. 16, pp. 69-82, October 28, 1899.

‡Auk. July, 1900. Under the title 'Ecology of the Maryland Yellowthroat and Its Relatives'.

§Science n. s. X, pp. 681-684. 1899.

‖15th An. Rept. Bureau of Animal Industry, U. S. Dept. of Agr., pp. 387-420. 1899.

¶Jour. Royal Hort. Soc. London, Vol. XXIV, under the title "Work of the United States Department of Agriculture on Plant Hybridization".

Albert F. Woods: Additional Notes on the Spot Disease of Carnations.*

November 9, 1899—311th Meeting.

The President in the chair and 26 persons present.

The following communications were presented:

L. O. Howard: Preliminary Notice of an Investigation of the Insect Fauna of Human Excrement.†

W. H. Dall: Notes on Honolulu and the Hawaiian Islands.‡

G. K. Gilbert: The Submerged Forests of the Columbia River.

November 18, 1899—312th Meeting.

The President in the chair and 39 persons present.

H. J. Webber called attention to the morphologically compound nature of the leaves of *Ampelopsis tricuspidata* and exhibited specimens collected by Doctor Evans.

The following communications were presented:

F. A. Lucas: Letter from H. H. Field concerning the Concilium Bibliographicum and the proposed Catalogue of the Royal Society.

F. V. Coville: The Botanical Explorations of Thomas Nuttall in California.§

Barton W. Evermann: A Physical and Biological Survey of Lake Maxinkuckee.

December 2, 1899—313th Meeting.

The President in the chair and 31 persons present.

W. H. Dall exhibited specimens of *Barringtonia speciosa* and called attention to the practice of stupifying the fish by this so called fish poison by throwing the bruised kernels into small ponds, etc.‖

Walter Evans stated that trifoliate and tripartite grape leaves are occasionally found similar to the specimens of *Ampelopsis tricuspidata* exhibited at the preceding meeting.

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*Bull. No. 19, Division of Vegetable Physiology and Pathology U. S. Dept. of Agr. 1900.

†Proc. Wash. Acad. Sci. II, pp. 541-603. 2 pl. and 22 figs.

‡Nation LXIX, No. 1792, pp. 331-333, Nov. 2, 1899.

§Proc. Biol. Soc. Wash. XIII, pp. 109-121, Dec. 30, 1899.

‖Nation LXIX, p. 331.

F. V. Coville exhibited an entire and bisected cone of *Pinus attenuata* both covered with lichens. These cones it was stated remain on the trees from twenty to fifty years and seem to open and release the seeds only when exposed to great heat, so that no seedlings of this pine were to be seen except where the ground had been swept over by fire.

The following communications were presented:

L. H. Dewey: Frost Flowers.

H. J. Webber: The Effect of Hybridization in the Origination of Cultivated Plants.*

O. P. Hay: The Chronological Distribution of Elasmobranchs.†

December 16, 1899—314th Meeting.

The President in the chair and 24 persons present.

H. J. Webber spoke of the necessity for a new horticultural term like *race* to refer to varieties of cultivated plants propagated by vegetative parts.

G. K. Gilbert called attention to the necessity for a broad term to apply to the sum of plants and animals occurring in a region. Attention was called to the word *life.*

The following communications were presented:

Lester F. Ward: The fossil Forests of Arizona.‡

F. A. Lucas: Blue Fox Trapping in the Pribilofs.§

M. B. Waite: Soil Inoculation Experiments with Soy Beans.

December 30, 1899—315th Meeting.

TWENTIETH ANNUAL MEETING.

The President in the chair and 11 persons present.

The annual reports of the Recording Secretary and Treasurer were read, and officers for the ensuing year elected as follows:

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*Yearbook U. S. Dept. of Agr. 1899, pp. 465-490, incorporated in an article entitled "Progress of Plant-breeding in the United States."

†Will appear in Trans. Am. Phil. Soc.

‡Published as "Report on the Petrified Forests of Arizona". Dept. of the Interior, 1900.

§Science, Jan. 26, 1900, pp. 125-128.

President: F. V. Coville.

Vice-presidents: Wm. H. Ashmead, C. W. Stiles, B. W. Evermann, F. A. Lucas.

Recording Secretary: H. J. Webber.

Corresponding Secretary: T. W. Stanton.

Treasurer: F. H. Knowlton.

Members of the Council: T. S. Palmer, C. L. Marlatt, A. F. Woods, C. L. Pollard, M. B. Waite.

The following standing committees were appointed by the President:

On Communications: F. A. Lucas, B. W. Evermann, A. F. Woods, V. K. Chesnut, and W. H. Osgood.

On Publications: F. H. Knowlton, T. S. Palmer, and C. L. Pollard.

January 13, 1900—316th Meeting.

Vice-president Lucas in the chair and 56 persons present.

W. R. Maxon called attention to an interesting bifurcation in a flight feather of the peacock.

William Palmer exhibited specimens of various fern fronds showing abnormal bifurcations.

W. H. Seaman mentioned a case of the bifurcation of the fourth rib in man.

F. A. Lucas spoke of the common occurrence of such bifurcations in animals.

H. J. Webber called attention to the similar bifurcations in the trunk of *Sabal palmetto*, three cases having been observed in Florida. One specimen of the same palm had been observed with three and one with four branches in the trunk; but such branching, is very rare.

The following communications were presented:

Vernon Bailey: Where the Grebe Skins come from.*

J. W. Daniel, Jr.: Zoological Collecting in Cuba.

William Palmer: The ferns of the Lower Shenandoah Valley.

E. L. Morris: A Revision of the Species of *Plantago* commonly referred to *P. patagonica.*†

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*Bird Lore II, p. 34. February, 1900.

†Bull. Torr. Bot. Club. **27**: 105-109. 1900.

January 27, 1900—317th Meeting.

The President in the chair and 30 persons present.

William Palmer exhibited specimens of abnormal fern fronds.

H. J. Webber exhibited specimens and photographs of aerating roots of *Taxodium*, *Avicennia*, *Laguncularia*, and *Rhizophora*.

O. F. Cook described a mangrove growing on dry land in Africa.

W. T. Swingle spoke of the occurrence of cypress knees in Europe where Doctor Lotsy stated they were not formed.

The following communications were presented:

T. A. Williams: Notes on a New *Lecidea* from Mexico.

Barton W. Evermann: Some observations concerning Species and Subspecies.*

February 10, 1900—318th Meeting.

The President in the chair and 45 persons present.

H. J. Webber exhibited a photograph of the tropical papaw (*Carica papaya*).

B. W. Evermann described the papaw as occurring in Puerto Rico.

The following communications were presented:

Henry W. Olds: Form in the Songs of Birds.

M. G. Kains: The Effect of the Electric Arc Light in the Culture of Easter Lilies.†

E. V. Wilcox: Lupines as Plants Poisonous to Stock.‡

February 24, 1900—319th Meeting.

The President in the chair and 8 persons present.

The following communications were presented:

W. A. Orton: The Sap-Flow of the Maple in Spring.

M. B. Waite: Michigan Peach Orchards.§

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*Science, n. s., **11**: 451-455. March 23, 1900.

†Florists Exchange, Feb. 22, 1900.

‡Jour. Comp. Med. and Vet. Arch. **20**: 666-774. 1899.

§Report Maryland State Hort. Soc. **2**: 41.

March 10, 1900—320th Meeting.

The President in the chair and 125 persons present.

The evening was devoted to a lecture by Prof. Dean C. Worcester on "The Birds and Mammals of the Philippines" (illustrated by lantern slides).

March 24, 1900—321st Meeting.

Vice-president Lucas in the chair and 46 persons present.

B. W. Evermann exhibited a number of colored illustrations of the peculiar and interesting fishes of Puerto Rico.

The following communications were presented:

Sylvester D. Judd: Feeding Experiments with Captive Birds.

W. H. Osgood: Notes on a Trip down the Yukon River.*

F. A. Lucas: The Tusks of the Mammoth.

April 7, 1900—322d Meeting.

Vice-president Ashmead in the chair and 37 persons present.

W. P. Hay exhibited living specimens of an interesting Crustacean (*Branchipus serratus*). It was stated that this genus, which is normally a fresh water form, has been transformed into a salt water form by being grown in salt solutions.

F. D. Gardner exhibited specimens of fine oolitie sand from shore of Salt Lake.

The following communications were presented:

L. O. Howard: Some New Illustrations of Insects (illustrated with lantern slides).

F. W. True: The Newfoundland Whale Fishery (illustrated with lantern slides).

April 21, 1900—323d Meeting.

The President in the chair and 28 persons present.

H. J. Webber described the migration of the vegetative nucleus in the pollen-tube of *Zamia* from the apex of the tube, when growth in that region ceases, back to the pollen-grain end of the tube, when the growth begins in that section of the tube just previous to fecundation.

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*N. Am. Fauna, No. 19. October 6, 1900. Under the title "Results of a Biological Reconnoissance of the Yukon River Region."

The following communications were presented:

C. H. Townsend: The Flying Foxes of the South Sea Islands (illustrated with lantern slides).

V. K. Chesnut: Acorns as Food.

W. A. Orton: The Sap-flow of the Maple (illustrated with lantern slides).

May 5, 1900—324th Meeting.

In the place of the regular meeting, a joint meeting with the Chemical Society was held, President Bolton, of the Chemical Society presiding. 65 persons were present.

The program for the evening consisted of a symposium on the topic "The Chemical and Biological Properties of Protoplasm". The discussion was led by Oscar Loew,* H. J. Webber, H. N. Stokes, and A. F. Woods.

May 19, 1900—325th Meeting.

Vice-president Lucas in the chair and 76 persons present.

The program of the evening consisted of a lecture by C. H. Townsend on "The Cruise of the Albatross in the South Sea Islands, with Notes on the Interesting Races of People Inhabiting the Islands, Their Natural History, etc." (illustrated with lantern slides).

October 20, 1900—326th Meeting.

The President in the chair and 49 persons present.

The following communications were presented:

H. J. Webber: Notes on Cotton Hybrids.†

L. H. Dewey: Some Foreign Varieties of Cotton.

W. A. Orton: Selection for Resistance to the Wilt Disease of Cotton.‡

L. M. Tolman: Economic Uses of Cotton Seed Oil.

November 3, 1900—327th Meeting.

The President in the chair and 23 persons present.

F. A. Lucas described a specimen of Buffalo Fish recently

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*Science, n. s., **11**: 930-935. June 15, 1900.

†New England Cotton Manufacturers' Association Report, 1900.

‡2 Bull. No. 27, Division of Vegetable Physiology and Pathology, U. S. Dept. of Agr.

received at the National Museum, which had no mouth. The fish, which had attained a weight of over one pound, must have fed by means of the gill openings.

W. H. Dall called attention to the discovery by T. Wayland Vaughan of a fossil coral reef in Decatur County, Georgia.*

The following communications were presented:

L. O. Howard: Insects Affecting Cotton.

Henry James: Recent Progress in Forestry.

M. W. Lyon: Notes on Venezuelan Zoology.

F. A. Lucas: The Deposit of Mastodon Bones at Kimmswick, Missouri.

November 17, 1900—328th Meeting.

The President in the chair and 57 persons present.

W. H. Dall spoke of a specimen of Chiton recently collected by Mr. Hemphill near San Diego, California, which had only six valves instead of the normal number eight.

M. B. Waite exhibited an abnormal apple showing a combination of three more or less perfect fruits. The specimens came from an orchard near Los Angeles, California, and the collector stated that such abnormal fruits were of common occurrence.†

The following communications were presented:

C. W. Stiles: The Structure and Life History of the Parasites of Malaria.

L. O. Howard: The Malaria Mosquitoes; Their Biology; What has been done and What may be done to Exterminate Them (illustrated with lantern slides).‡

December 1, 1900—329th Meeting.

Vice-president Lucas in the chair and 26 persons present.

The following communications were presented:

L. Stejneger: On Post-Pliocene Migration of Siberian Animals into Europe.

Erwin F. Smith: Sugar Beets in New York and Michigan.

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*Science n. s., **II**: 873. December 7, 1900.

†Will be published in Rural New Yorker.

‡Bull. No. 25, New Series, Division of Entomology, U. S. Dept. of Agr.

December 15, 1900—330th Meeting.

The President in the chair and 25 persons present.

F. A. Lucas exhibited a skeleton of the gar-pike where a fracture in the skull had caused a marked deflection but which had not resulted in death, as shown by the callus connecting the broken bones.

The following communications were presented:

C. W. Stiles: Some Tropical Parasites that may be Introduced by our Returning Troops.

E. W. Nelson: The Caribbean Seal.

December 29, 1900—331st Meeting.

(TWENTY-FIRST ANNUAL MEETING.)

Vice-president Lucas in the chair and 19 persons present.

The annual reports of the Recording Secretary and Treasurer for the year 1900 were presented and the following officers elected for the ensuing year:

President: F. A. Lucas.

Vice-presidents: B. W. Evermann, Wm. H. Ashmead, C. W. Stiles, F. H. Knowlton.

Recording Secretary: W. H. Osgood.

Corresponding Secretary: T. W. Stanton.

Treasurer: David White.

Members of the Council: A. F. Woods, C. L. Pollard, T. S. Palmer, M. B. Waite, H. J. Webber.

The following standing committees were appointed by the President-elect:

On Communications: B. W. Evermann, V. K. Chesnut, W. H. Osgood, A. F. Woods.

On Publications: C. L. Pollard, T. S. Palmer, David White.

VOL. XIII, PP. 1-8 JANUARY 31, 1899

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON THE NAKED-TAILED ARMADILLOS.*

BY GERRIT S. MILLER, JR.

The following notes on the naked-tailed armadillos are the result of an attempt to name some specimens belonging to the United States National Museum, the Academy of Natural Sciences of Philadelphia, the American Museum of Natural History, and Mr. Outram Bangs. The subject naturally divides itself into four sections: 1, History of the generic and subgeneric names; 2, The genus *Tatoua* and its subgenera; 3, The naked-tailed armadillo of Central America, and 4, Comparison of three small species of *Tatoua*.

1. HISTORY OF THE GENERIC AND SUBGENERIC NAMES.

Wagler, in 1830, was the first author to recognize the naked-tailed armadillos as a distinct genus. He called the group *Xenurus*, unaware that, four years earlier, this name had been used by Boie in Ornithology. The large species then recently described as *Dasypus gymnurus* by Wied, but previously named *Dasypus unicinctus* by Linnæus, served as the type of his new genus.

Gray, in 1865 and 1869, divided Wagler's genus into two subgenera, the first containing the large species known to Wagler, the second the small *Dasypus hispidus* described by Burmeister in 1854. To the second, which he expressly states that he had never seen, he transferred the name *Xenurus* in a restricted sense, while to the first he applied a new name, *Tatoua*. *Tatoua*, thus exactly equivalent to Wagler's *Xenurus*, is therefore the first tenable generic name for the naked-tailed armadillos.

In 1873 Gray again applied the name *Xenurus* to the large species, making no reference to his previous subdivisions, and describing the small *hispidus* as a new species, '*X. latirostris*.' Another small armadillo, which he regarded as the representative of a new genus, he described under the name *Ziphila lugubris*.

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Not until 1891 was the fact recognized that the name *Xenurus* is untenable for a mammal. Then Ameghino pointed out the long-standing error, but overlooking Gray's *Tatoua*, proposed as a substitute for *Xenurus* the new name *Lysiurus*.

In this course Ameghino has recently been followed by Trouessart, who refers the naked-tailed armadillos as a whole to *Lysiurus*, and places under it as a subgenus Gray's *Ziphila*, notwithstanding that the latter was named eighteen years earlier.

The little known *Ziphila lugubris* has been a source of continual uncertainty, though since Gray, most writers, Trouessart excepted, have agreed in regarding it as very doubtfully distinct from '*Xenurus*' *hispidus*, an animal much better represented in collections. It is, however, in no way closely related to *Tatoua hispida*, but a distinct species, the representative of a well-marked subgenus, for which, of course, the name *Ziphila* is available.

2. The Genus Tatoua and Its Subgenera.

Genus TATOUA Gray.

1830. *Xenurus* Wagler, Natürl. Syst. der Amphibien, mit vorang. Classif. der Säugeth. und Vögel, p. 36. Type *Dasypus gymnurus* Wied=*D. unicinctus* Linnæus. (Not *Xenurus* Boie, 1826.)
1865. *Xenurus* Gray, Proc. Zool. Soc. London, p. 377.
1865. *Tatoua* Gray, Proc. Zool. Soc. London, p. 378.
1869. *Xenurus* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 383.
1869. *Tatoua* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 384. Type *Dasypus unicinctus* Linnæus.
1873. *Xenurus* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 21.
1891. *Lysiurus* Ameghino, Revista Argentina de Hist. Natural, I, p. 254. Type *Dasypus unicinctus* Linnæus.
1898. *Lysiurus* Trouessart, Catal. Mamm. tam vivent. quam foss., p. 1146.

Type species.—*Tatoua unicincta* (Linnæus).

Characters.—Teeth $\frac{8-8}{8-8}=32$ to $\frac{9-9}{9-9}=36$, subcylindrical in form, the last about opposite middle of zygomatic arch and some distance in advance of posterior border of palate; tail long, covered with minute, thin widely spaced plates; claws on front feet very greatly developed.

Subgenus TATOUA Gray.

1865. *Tatoua* Gray, Proc. Zool. Soc. London, p. 378.
1869. *Tatoua* Gray, Catal. Carnivorous, Pachydermatous and Edentate Mammalia in the British Museum, p. 384.
1873. *Xenurus* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 21.
1898. *Lysiurus* Trouessart, Catal. Mamm. tam vivent. quam foss., p 1146.

Type species.—Tatoua unicincta (Linnæus).

Subgeneric characters.—Crown armor consisting of 50 to 60 small, roundish, irregularly arranged plates; ears rounded, funnel-formed, densely coated with minute scales on outer side; cheeks covered with thin plates arranged in distinct rows.

Subgenus ZIPHILA Gray.

1873. *Ziphila* Gray, Hand-List of the Edentate, Thick-Skinned and Ruminant Mammals in the British Museum, p. 22. Type *Z. lugubris* Gray.
1898. *Ziphila* Trouessart, Catal. Mamm. tam vivent. quam foss., p. 1148.

Type species.—Tatoua lugubris (Gray).

Subgeneric characters.—Crown armor consisting of 30 to 40 symmetrically arranged, mostly pentagonal or hexagonal plates; ears pointed, not funnel-formed, the outer side bare except along margin; cheeks with a few widely spaced, irregularly scattered scales.

3. The Naked-tailed Armadillo of Central America.

Dr. A. von Frantzius published the first record of the occurrence of a naked-tailed armadillo in Central America in 1869. He was uncertain as to the identification of the animal—the 'armadillo de zopilote' of the Costa Ricans, so called on account of the disagreeable buzzard-like odor of its flesh—as he saw only a living individual and a skull. Both, however, indicated an animal smaller than the *Dasypus gymnurus* of Illiger (= *D. unicinctus* Linnæus), to which he with hesitation referred the species. Doubt was cast on this record by Alston in 1880, who found no naked-tailed armadillos among the collections that served for the elaboration of the mammals of the Biologia Centrali-Americana.

In 1895 Mr. Frederick W. True recorded a small *Tatoua* from Chamelicon, Honduras, the first positively known to have been taken in Central America. In the absence of material for comparison, he regarded the animal as "presumably the *X*[*enurus*] *hispidus* of Burmeister."

Two years later Mr. A. Alfaro and Dr. J. A. Allen confirmed Dr. von Frantzius' Costa Rican observations by recording the capture of a specimen at Suerre, Costa Rica. This animal is referred to '*Xenurus gymnurus*' (= *Tatoua unicincta*) without comments on the doubts expressed by Dr. von Frantzius, or on Mr. True's identification of the Honduras specimen.

So far as I know, this completes the published history of the naked-tailed armadillo in Central America. I may add, however, that Mr. José C. Zeledon has recently informed me that the armadillo de zopilote is well known in Costa Rica, where the worthlessness of its flesh for food is everywhere recognized.

I have recently compared the two Central American specimens with one from Santa Marta, Colombia, and two from Matto Grosso, Brazil. The latter prove to be representatives of the subgenus *Tatoua*, while all of the others are referable to *Ziphila*. The Costa Rican and Honduras specimens are precisely alike in all important characters, but they differ in many details from the Colombian animal, which in all probability is the same as Gray's *Ziphila lugubris*. While the fact that Gray's type came from Brazil throws some doubt on this determination of the specimen from Colombia, it does not lessen the probability that the Central American *Ziphila* is distinct from the one hitherto described. The Central American animal may stand as:

Tatoua (Ziphila) centralis sp. nov.

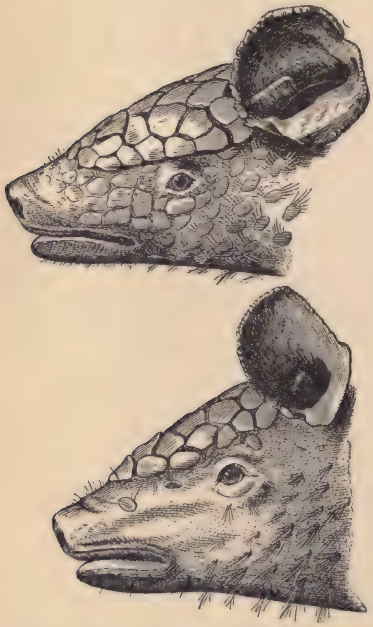

FIG. 1.—Head from side: upper figure, *Tatoua (Tatoua) hispida*; lower figure, *T. (Ziphila) centralis* (type). ⅔ nat. size.

1869. *Dasypus gymnurus* Frantzius, Wiegmann's Archiv für Naturgeschichte, XXXV, Bd. I, p. 309 (not *Dasypus gymnurus* Illiger, 1815).

1895. *Xenurus hispidus* True, Proc. U. S. National Museum, XVIII, p. 435 (not *Dasypus hispidus* Burmeister, 1854).

1897. *Xenurus gymnurus* Alfaro, Mammíferos de Costa Rica, p. 46.

1897. *Xenurus gymnurus* Allen, Bull. Am. Mus. Nat. Hist., IX, p. 43.

Type, adult ♀ (skin and skull), No. $\frac{19464}{35382}$, United States National Museum, collected at Chamelicon, Honduras, January 8, 1891, by Erich Wittkügel.

General characters.—Smaller than *Tatoua (Ziphila) lugubris* (Gray); cheeks with fewer scales; plates in central rings of carapace more numerous (29–31, instead of 27); occipital region of skull much less elevated; zygomata when viewed from above nearly parallel with each other and with main axis of skull; hamular processes of ptrygoids neither thickened nor bent inward at tips.

4. COMPARISON OF THREE SMALL SPECIES OF TATOUA.

Tatoua (Tatoua) hispida (Burmeister).

1854. *Dasypus hispidus* Burmeister, Syst. Uebers. der Thiere Brasiliens, 1st Theil (Mammalia), p. 287 (Lagoa Santa, Brazil).
1873. *Xenurus latirostris* Gray, Hand-List of the Edentate, Thick-Skinned, and Ruminant Animals in the British Museum, p. 22 (St. Catherines, Brazil).

Crown shields about 55 (50–60), very irregular both in form and arrangement, their sides and angles rounded, none regularly pentagonal or hexagonal, those at front of shield gradually diminishing in size and distinctness. Cheeks covered with thin scales, closely set in distinct rows. Ears rounded above, the lower lobe greatly developed, the resulting form of the conch roughly funnel-shaped, with a distinct notch in the periphery in front below, and another behind above. A long, low ridge on inner side of conch above and in front of meatus. Internal surface of ear naked. External surface densely coated with roundish scales about 1 mm. in diameter.

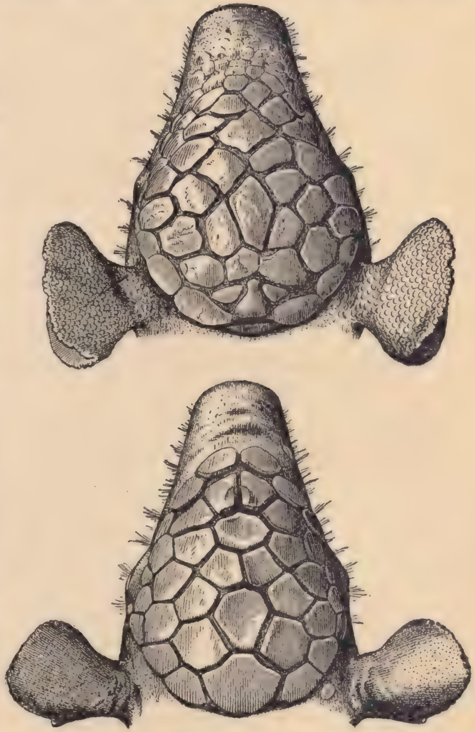

FIG. 2.–Head from above: upper figure, *Tatoua* (*Tatoua*) *hispida;* lower figure, *T.* (*Ziphila*) *centralis* (type). ⅔ nat. size.

Rough periphery of plates of body armature very conspicuous, the smoother central portion generally irregular and much pitted. Scapular shield consisting of seven or eight rows, the longest of which contains about 28 plates. On neck in front of scapular shield are three rows (the longest containing about 8 plates) of rectangular, closely appressed plates, the anterior rows regularly imbricating over the posterior. Dorsal rings 9, the longest containing 25 plates. Pelvic shield containing 9 rows, the longest with about 25 plates; the furrows between the plates wide and irregular. The majority of the plates of the dorsal armature are provided with from one to four conspicuous, grayish, bristle-like hairs, which spring from the posterior borders and mostly from the corners of the plates; when from the posterior edge, away from the corners, each hair stands in a distinct excavation or scallop. These bristles are most conspicuous on the sides of the body, where they are often 15 mm. in length.

Tail about one-half as long as body armature, the scales arranged in about 10 rows; longest scales (near base of tail) oval, about 4 mm. long and half as broad; most of the scales on dorsal surface of tail with 1–3 short bristles springing from posterior edge.

Skin of belly with transverse rows of well-developed scales, the rows about 7 mm. apart; each scale with a tuft of 4–6 appressed bristles springing from its posterior edge, the scales themselves averaging about 2 mm. by 3 mm. in size. Outer side of feet and legs covered with large scales (the largest 7 mm. by 9 mm.), from the posterior edges of which spring conspicuous tufts of bristles.

Skull triangular in profile, the facial line little broken by supraorbital swellings or postorbital depression. Zygomata greatly expanded and thickened at middle.

Tatoua (**Ziphila**) **lugubris** (Gray).

1873. *Ziphila lugubris* Gray, Hand-List of the Edentate, Thick-Skinned, and Ruminant Mammals in the British Museum, p. 23 (St. Catherines, Brazil).

Crown shields about 33 (30–35), regular in form and bilaterally symmetrical in arrangement, their angles distinct and sides (usually 5 or 6) straight, those at front of shield large and equal to the others in definiteness of form. Each cheek with about 20 small, irregularly scattered scales. Ears pointed above, the lower lobe very slightly developed, the resulting form of conch not at all funnel-shaped. A short high ridge on inner side of conch above and in front of meatus. Internal surface of ear naked. External surface of ear naked except for a row of scales, each about 1 mm. in diameter, along entire external border of conch, and a secondary row 7 mm. in length extending downward from slightly developed notch between upper and lower lobes.

Rough periphery of plates of body armature inconspicuous, the smooth central portion generally flat and polished. Scapular shield consisting of 7 or 8 rows, the longest of which contains about 28 plates. On neck in front of scapular shield are two or three rows (the longest containing about 8 plates) of irregularly lenticular, widely spaced plates, the rows not imbricating. Dorsal rings 10, the longest consisting of 26–27 plates. Pelvic shield containing 10 rows, the longest with about 25 plates; the furrows between the plates narrow and regular in outline. The majority of the plates of the dorsal armature are provided with one or two small, very inconspicuous bristles growing from the extremities of the posterior borders. These bristles, the longest of which are less than 10 mm. in length, are more readily detected by touch than by sight.

Tail considerably more than half as long as body armature, the scales arranged in about 14 rows; longest scales (near base of tail) roundish, about 3 mm. in diameter; most of the scales on dorsal surface, with one (never more) bristle springing from posterior edge.

Skin of belly with transverse rows of poorly developed scales, the rows about 7 mm. apart; each scale with a tuft of 3–5 appressed bristles; the largest of the scales slightly smaller and less definite in form than those of *T. hispida*; the smaller reduced to mere elevations in the skin, surmounted by the tuft of bristles. Outer side of feet and legs covered with scales, the largest of which are not more than 5 mm. by 7 mm. in diameter.

Skull triangular in profile, the facial line distinctly broken by the prominent supraorbital swellings. Rostrum noticeably more slender than in *T. hispida;* zygomata much more lightly built than in *T. hispida*, bent outward so as form almost an angle at middle. Palate behind tooth row narrower than in *T. hispida* and abruptly raised to a slightly higher plane. Hamulars thickened and strongly bent inward at tips.

Tatoua (**Ziphila**) **centralis** Miller.

1899. *Tatoua* (*Ziphila*) *centralis* Miller, Proc. Biol. Soc. Washington, XIII, p. 4.

Crown shields about 38 (37–39), otherwise as in *T. lugubris*. Each cheek with less than a dozen small, irregularly scattered scales. Ears as in *T. lugubris*, except that scales along border of conch are less conspicuous and secondary row on back of ear is lacking.

General character of plates of body armature as in *Z. lugubris*. Scapular shield consisting of seven or eight rows, the longest of which contains about 28 plates. Neck shields as in *T. lugubris*. Dorsal rings 10, the longest containing 29–31 plates. Pelvic shield as in *T. lugubris*. Bristles, tail, and scales on belly and legs as in *T. lugubris*.

Skull slightly larger than in *T. lugubris;* rostrum distinctly longer. Hamulars neither thickened nor bent inward at tip. Zygomata much less strongly bent outward than in *T. lugubris*, so that, when viewed from above, they are nearly parallel.

Cranial Measurements of Three Species of Tatoua.

	T. hispida,* Brazil.	*T. hispida*,* Brazil.	*T. lugubris*,† Colombia.	*T. centralis*,‡ Honduras.	*T. centralis*,§ Costa Rica.
Greatest length	83	75	73	80	78
Basal length	75	69	67	73	72
Basilar length	68	62	61	65	64
Occipital depth	29	26	27	29	28
Depth of rostrum at tip of premaxillaries	11.6	11	9	9.4	9.4
Mastoid breadth	36	36	35	38	37
Zygomatic breadth	46	42	38.6	41	39
Interorbital constriction	27	25	24.4	24	26
Rostral constriction	19	17	16.4	17	18
Length of nasals	29	.....	23	27	28
Palatal length	47	44	44	47	47
Mandible	30	26	28	28.4	29
Upper tooth row	63	58	58	62	60
Lower tooth row	27.4	24	24	25	26.4

* Academy of Natural Sciences, Philadelphia.

† Bangs collection.

‡ Type, U. S. National Museum.

§ American Museum of Natural History.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW PIGMY *ORYZOMYS* FROM THE SANTA MARTA REGION OF COLOMBIA.

BY OUTRAM BANGS.

Mr. W. W. Brown Jr.'s collection from Santa Marta, Colombia, contains series of two species of pigmy *Oryzomys*. I have sent specimens of both species to Mr. Oldfield Thomas, who has, with great kindness, compared them with the material in the British Museum. One species is *O. dryas humilior* Thomas, originally described from Bogotá. The other, although near *O. fulvescens* Allen and Chapman, from Jalapa, Mexico, proves to be new. Of *O. dryas humilior* Mr Brown took twelve specimens, all at Macotama (alt., 8000 ft.). Of the new form he took ten specimens at Palomina (5000 ft.), Pueblo Viejo (8000 ft.), and San Miguel (7500 ft.).

The two forms are very different; *O. dryas humilior*, the larger, may always be known by its darker colors and rich fulvous under parts. The new form may be known from the following description:

Oryzomys navus* sp. nov.

Type from Pueblo Viejo, Sierra Nevada de Santa Marta, Colombia. No. 8107, ♂ adult, coll. of E. A. and O. Bangs. Collected March 26, 1898, by W. W. Brown, Jr. Altitude, 8000 feet.

General characters.—Apparently nearest *O. fulvescens* Allen and Chapman from Jalapa, Mexico, differing in longer tail, smaller ears, paler, more yellowish coloration and purer white under parts. Skull not showing any marked differences from skulls of other members of this group, although slightly different from that of the *O. dryas* group (see Thomas, Ann. and Mag. Nat. Hist., 7th ser., II, 1898, p. 267).

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* Navus, diligent, active.

Color.—Upper parts tawny ochraceous, lined with brownish black-tipped hairs, which are most numerous on top of head and on middle of back, but more scattering on rump; lower sides and upper surface of arms and legs paler and more mixed with buffy; under parts white, the hairs pale gray at base on center of belly only, while on throat, neck, and under surface of legs they are white to the base; ears dark brown; feet and hands whitish; tail very long, nearly naked, dusky above, dull grayish white below.

Measurements.—The type, ♂ adult, total length, 193; tail vertebræ, 115; hind foot (with claw), 20; ear from notch, 14. The two largest individuals from San Miguel measure—No. 8223, ♂ adult, total length, 200; tail vertebræ, 115; hind foot (with claw), 22; ear from notch, 13; and No. 8225, ♀ adult, total length, 200; tail vertebræ, 115; hind foot (with claw), 22; ear from notch, 13.

Skull, the type, ♂ adult, basal length, 17.6; zygomatic width, 11.6; mastoid width, 9.2; interorbital width, 3.8; length of nasals, 7; length of upper molar series, 3.2; length of mandible, 11.2.

Remarks.—There is a slight individual variation in color among the ten specimens of *O. navus*, due principally to the greater or less number of black-tipped hairs scattered along the back and head—some specimens being more nearly clear tawny ochraceous than the type.

The species of pigmy *Oryzomys* form a compact group of closely related forms, many of which may prove only subspecifically distinct from one another, but until their relationships are better understood it seems well to give the new form full specific rank.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW VOLE FROM EASTERN SIBERIA.[*]

BY GERRIT S. MILLER, JR.

A small *Microtus* taken at Plover Bay, East Siberia, has remained unidentified in the United States National Museum for more than thirty years. It differs from any of the Asiatic species of which I can find descriptions, and may be known as:

Microtus tshuktshorum sp. nov.

Type, ♀ adult (in alcohol), No. $\frac{8419}{37610}$, United States National Museum, collected at Plover Bay, East Siberia, by Lt. Dawson (received in 1866).

General characters.—Most like *Microtus kamtschaticus* (Polyakoff), from Petropaulski, Kamchatka, but smaller; skull with shorter nasals, less perforated palate, and much smaller angular process of the mandible (in this character resembling *M. kadiacensis*).

Ears.—Except for their very small size—they are much overtopped by the surrounding fur—the ears show no characters of importance.

Feet.—The feet are similar to those of *M. arvalis*. Palms with five tubercles, all well developed. Soles with five large tubercles and a rudimentary sixth.

Fur and color.—The fur is remarkably soft and long, some of the hairs on the back reaching a length of nearly 20 mm. After its long immersion in alcohol the fur has probably lost all trace of its original color. It is now dull chestnut on the back, soiled yellowish white on the belly.

Skull.—The skull of *Microtus tsuktshorum* is small and rounded, little ridged for muscular attachment. In general form it agrees closely with that of *M. kamtschaticus*, but the nasal bones are very noticeably shorter (5.8 mm. in *M. tshuktshorum*, as opposed to a range of from 6.8 to 7.8 in seven skulls of *M. kamtschaticus*), and the palate differs notably from that of any of the specimens of *M. kamtschaticus* in the small size and insignificant number of foramina immediately in front of the lateral bridges. As a result the bridges are not distinguishable. The mandible is conspicuously more slender than that of *M. kamtschaticus*, and the articular and angular processes are very noticeably weaker. In this respect *M. tshuktshorum* shows an approach to *M. arvalis* of Europe, and an even closer resemblance to *M. kadiacensis*.

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[†] Tshuktskorum, Tschuktski, a tribe of natives in eastern Siberia.

Teeth as in *M. kamtschaticus*.

Measurements.—Total length, 113; tail vertebræ; 29; pencil, 8; hind foot (with claws), 19; ear from meatus, 10; ear from crown, 8. Skull: greatest length, 23.8; basal length, 23; basilar length, 21.6; zygomatic breadth, 13; interorbital constriction, 4; mastoid breadth, 12; palatal length, 12.4; diastema, 7.8; nasals, 5.8; incisive foramen, 4; mandible, 14.8; maxillary tooth row (alveoli), 6.4; mandibular tooth row, 6.

VOL. XIII, PP. 13-14 JANUARY 31, 1899

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW VOLE FROM HALL ISLAND, BERING SEA.*

BY GERRIT S. MILLER, JR.

A specimen of *Microtus* collected by Mr. C. H. Townsend on Hall Island, Bering Sea, represents a species distinct from any hitherto described. It is a rather large member of the typical group of the subgenus *Microtus*, and is more nearly related to a Siberian species which I suppose to be *M. kamtschaticus* (Polyakoff) than to any of the known Alaskan members of the genus except *M. kadiacensis*. On account of its remarkably short tail it may be called:

Microtus abbreviatus sp. nov.

Type, ♀ young adult (skin and skull), No. $\frac{15540}{22429}$, United States National Museum, collected on Hall Island, Bering Sea, September 8, 1885, by C. H. Townsend.

General characters.—Size rather large (hind foot, 23 mm.); tail shorter than hind foot; plantar tubercles, 6; ears concealed in the fur; enamel pattern essentially as in *Microtus arvalis* of Europe.

Fur and color.—The fur is dense and only moderately long—about 12 mm. in length at middle of back—but the specimen was taken when in the midst of the autumnal molt, with the short new hairs of the winter coat appearing as a dense mat among the roots of the longer fur. As the skin has been preserved in alcohol for an unknown period,† the original color of the animal cannot be determined with certainty. In its present condition the dorsal surface is light yellowish brown, duller on head, clearer on rump, paling on the sides to the soiled buff of the under parts, which are slightly darker on chest. Tail bicolor, brownish above, yellowish white beneath. Feet dirty whitish.

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† Mr. Townsend tells me that the specimen was preserved dry. It was received at the National Museum in September, 1886, and its subsequent history is not known. It was found in a bottle of alcohol in October, 1898.

Skull and teeth.—The skull is imperfect, lacking the occipitals and one of the audital bullæ. It resembles that of *M. kamtschaticus* very closely, but the rostrum is slightly narrower anteriorly, the mandible is less heavily built, and the bony palate is noticeably different in form. In the palate of *M. kamtschaticus* the lateral bridges are broad and well developed and the lateral pits are deep and very noticeable. In *M. abbreviatus* the bridges are small and barely complete, while the pits behind them are shallow and inconspicuous. In no one of the seven specimens of *M. kamtschaticus* with which I have compared it is the peculiar palate of *M. abbreviatus* closely approached.

Teeth slightly smaller than in *M. kamtschaticus*, but enamel pattern essentially the same in the two species. *M. abbreviatus*, however, has the anterior loop of the front lower molar distinctly longer than in *M. kamtschaticus.* In *M. kamtschaticus* there is usually a well developed fourth outer salient angle on the posterior upper molar. This is quite absent in *M. abbreviatus*, but the character is not likely to prove constant.

*Measurements.**—Total length, 120; tail vertebræ, 19 (pencil, 9); hind foot, 22.5; ear from meatus, 9.5; ear from crown, 6. Skull: greatest length, 27; zygomatic breadth, 15; interorbital constriction, 4; nasals, 7.8; mandible, 17.4; maxillary tooth row (alveoli), 6.4; mandibular tooth row (alveoli), 6.6.

General remarks.—Microtus abbreviatus is closely related to both *M. kamtschaticus* and *M. kadiacensis*, though in external appearance its short, densely haired tail gives it a much closer resemblance to the members of the subgenus *Phaiomys.* In cranial and dental characters it differs from *M. kadiacensis* much as it does from *M. kamtschaticus*, since these two species agree closely in palate structure and in the form of the front lower molar.

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*All from skin in alcohol.

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PROCEEDINGS

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THE FLORIDA PUMA.

BY OUTRAM BANGS.

In his book entitled 'Hunting and Fishing in Florida,' published in 1896, Mr. Charles B. Cory gave a brief description of the Florida Puma, and named it *Felis concolor floridana* (pp. 109–110). This name is untenable, both Desmarest* and Fischer† having used *Felis floridana*‡ for the Florida Lynx.

I therefore propose for the Florida Puma the name:

Felis coryi sp. nov.

Type from the wilderness back of Sebastian, Florida. No. 7742, ♂ old adult, coll. of E. A. and O. Bangs. Collected Jan. 1, 1898, by F. R. Hunter.

General characters.—Size very large; feet very small; apparently no seasonal change in color; back ferruginous, finely lined with blackish; sides paler and more fawn color; skull like that of the North American pumas, and not at all like the skulls of Central and South American species.§

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*Mammalogie, 1820, p. 225, species No. 350.

†Synopsis Mamm., 1829, p. 213.

‡*Lynx floridanus* Raf., Am. Monthly Mag., 1817, p. 46. Based on the Lynx or Wildcat of Bartram.

§See description of *Felis hippolestes* Merriam, Proc. Biol. Soc., Wash., vol. XI, July 15, 1897, p. 219. I have compared skulls of the Florida Puma with that of a fine adult ♀ taken at Santa Marta, Colombia, Feb. 15, 1898, by W. W. Brown, Jr., which I take to be true *Felis concolor* Linn. That of *F. concolor* is very small, with low, flat unswollen frontals; long, slender and only slightly decurved postorbital processes; differently shaped nasals; much less well developed sagittal crest, falling much farther back; small teeth; and inner cusp of carnassial not well developed. Roughly speaking, this skull resembles that of a large ocelot more than it does the skulls of North American pumas.

Color.—Type, ♂ old adult. Pelage very short and rather harsh. Top of head, upper surface of neck and back, and upper half of tail ferruginous, finely lined with blackish tipped hairs, with little bunches of white hairs scattered here and there; sides of neck and body, an ill-defined patch above and behind each shoulder, a band across under side of neck, and upper surfaces of limbs, paler and more inclined toward fawn color, many of the hairs with darker tips; under parts, including under surfaces of limbs and under side of tail, soiled whitish, except on middle of body, where the color is much darker and more hair brown; tail dusky toward end and nearly black at tips; ears black, grizzled around edges; hairs between pads of feet black; face rather dark and grizzled with a light spot above each eye; patch at base of whiskers black; whiskers mostly white, but in a few cases black.

Other specimens, though killed at different seasons of the year, differ but little from the type. A kitten three-fourths grown is similar, but has the upper surface marked with large, irregular dusky spots.

Cranial characters.—Skull large, showing all the characters of the North American pumas pointed out by Dr. Merriam. It is apparently narrower than the skull of *F. hippolestes* Merriam, with less widely spreading zygomata. I have compared it with a skull of *F. oregonensis* Raf.,* from the vicinity of Tacoma, Wash., and find it slightly narrower, with less widely spread zygomata; slightly narrower palatal extension; palate ending in more of a curve—less squarely. These differences are trifling, however, and may not be constant.

Measurements.—The following measurements of the type and an old ♀, No. 7743, killed at the same time and place, were taken by F. R. Hunter from the animals in the flesh. Type, ♂ old ad.: whole length, 6 ft. 9 in.; fore leg, 2 ft. 8 in.; hind leg, 2 ft. 8 in.; girth of chest, 2 ft. 7 in.; of waist, 2 ft. 8 in.; of neck, 22½ in. No. 7743, ♀ old ad.: whole length, 6 ft. 3½ in.; fore leg, 2 ft. 5 in.; hind leg, 2 ft. 6 in.; girth of chest, 2 ft. 2 in.; of waist, 2 ft.; of neck, 21½ in.

Total length reduced to millimeters and the tails and hind feet measured by me from the skins are as follows: Type, total length, 2057.4; tail, without hairs, 760; hind foot, 280. No. 7743: total length, 1917.7; tail, without hairs, 670; hind foot, 271. No. 6992, very old male topotype, unmeasured, is even larger and has a larger skull.

Skull.—Type, basal length, 171; occipitonasal length, 194; zygomatic width, 135; palatal length (from end of pterygoid process to back of middle incisors), 110.4; postpalatal length, 91; width across postorbital processes, 75.; interorbital width, 40.8.

No. 5489, old adult ♀ topotype: basal length, 157.4; occipitonasal length, 175; zygomatic width, 126; palatal length, 102; postpalatal length, 84; width across postorbital processes, 76.6; interorbital width, 40.

Remarks.—According to all the information I have been able to glean, the Florida Puma is now restricted to peninsular Florida and can no longer intergrade with any other form, and it is doubtful if it ever did.* It must, therefore, be given full specific rank.

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* Stone, Science, N. S., Jan. 6, 1899, pp. 34–35.

Compared with true *F. concolor* Linn., *F. coryi* is a huge Puma, and is indeed but little smaller than the giant of the Rocky Mountains, *F. hippolestes* Merriam. Its long limbs, small feet, and rich ferruginous color are the best characters by which to distinguish it from other North American pumas. It needs no comparison with the small pumas of northern South America or of Central America.

The Bangs collection now contains six specimens of *F. coryi* (skins and skulls complete), all taken by F. R. Hunter in the same general region of Florida, namely, the great wilderness back of Sebastian, in Brevard and Osceola counties. Mr. Hunter writes that three of these pumas, the type an old female and the young female, were all killed together on New Year's day, 1898.

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* Mr. F. W. True, in his monograph on the Puma, under the head of Virginia, says: "Mr. Hallock makes the very interesting statement that the Puma is found in the Dismal Swamp. I find no other reference to its occurrence in the low coast lands of the South Atlantic States except in Florida" (p. 599).

VOL. XIII, PP. 19-21 JANUARY 31, 1899

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF SIX NEW RODENTS OF THE GENERA *APLODONTIA* AND *THOMOMYS.*

BY C. HART MERRIAM.

Specimens of *Aplodontia* from a few miles south of the Cascades of the Columbia—apparently the type locality of *A. rufa*—differ specifically from the small coast animal commonly mistaken for *rufa*. Comparison of the typical form with specimens from the Olympic Mts., the coast of Oregon, and Point Reyes, California, shows that several very distinct species remain undescribed. The northern form of the Sierra-Cascade species also proves to be different from typical *A. major*. All of these are here described, and with them two new Pocket Gophers from northwestern Washington.

Aplodontia pacifica sp nov.

Type from Newport, mouth of Yaquina Bay, Oregon. No. 77372 ♀ ad. U. S. Nat. Mus., Biological Survey Coll. Collected March 20, 1896, by B. J. Bretherton. Original No. 2219.

Characters.—Size small, by far the smallest of the known species; ear longer (higher) than in any of the others; color darker and richer; white spot at base of ear usually distinct.

Color.—Upper parts in winter pelage fulvous brown, strongly mixed with black hairs, the fulvous strongest on flanks and sides of neck, least apparent on head and rump, which parts are sepia or bister, becoming dusky on nose; top of head strongly mixed with black hairs; cheeks suffused with fulvous; under parts plumbeous, strongly washed with fulvous; legs, feet and tail grizzled grayish-dusky.

Cranial characters.—Skull small, light, and relatively narrow; zygomata less spreading than in the other species; rostrum slender; interorbital constriction rather broad; palate narrow. Contrasted with *A. rufa* the skull is decidedly smaller and narrower, the rostrum longer and much more slender; the zygomata very narrow, not spreading or bowing outward as in *rufa*; audital tubes very much more slender and much shorter; frontal platform between orbits and rostrum (seen from above) very much smaller, narrower, and more rounded laterally—less flattened.

Dental characters.—Small upper premolar very large, at least twice as large as in *rufa* or *major*, molars actually as large as—relatively much larger than—in *rufa*.

Measurements.—Type specimen: Total length 304; tail vertebræ 22; hind foot (in dry skin, moistened) 48.

Aplodontia phæa sp. nov.

Type from Pt. Reyes, Marin Co., California. No. $\frac{2645}{3273}$ ♂ ad. Merriam Coll. Collected August 1, 1886, by C. A. Allen. Orig. No. 142.

Characters.—Size small; coloration (in July and August specimens) remarkably uniform grizzled bister brown without rufous or fulvous; ears much smaller (shorter) than in *A. pacifica*.

Cranial characters.—Skull of medium size, larger than that of *pacifica*, smaller than that of *rufa*; zygomata spreading but less bowed out than in *rufa*, the anterior root standing out squarely with a well developed angle; rostrum slender; nasals short, abruptly narrowed posteriorly, and ending considerably in front of posterior plane of premaxillæ; interorbital region broad; audital bullæ and tubes intermediate in size between those of *rufa* and *pacifica*, the tubes of same length as in *pacifica*—much shorter than in *rufa*; incisive foramina small and compressed or 'pinched in'; small upper premolar about as in *rufa*—decidedly smaller than in *pacifica*.

Measurements.—Type specimen: Total length 330; tail vertebræ 30; hind foot (in dry skin, moistened) 55.

Aplodontia olympica sp. nov.

Type from Queniult Lake, Olympic Mts., Washington. No. 89549 ♂ yg.-ad. U. S. National Museum, Biological Survey Coll. Collected July 24, 1897, by R. T. Young. Original No. 309.

Characters.—Similar to *A. rufa* but larger and darker; upper parts less 'reddish' or fulvous; nose darker; white spot at base of ear absent or poorly developed.

Cranial characters.—The skull of *A. olympica* differs from that of *A. rufa* in the following characters: interorbital constriction decidedly narrower (measuring from 8.5 to 10 mm. in 8 adults as contrasted with 11 mm. in the narrowest of the *rufa* series); zygomata standing out more strongly anteriorly with a thickened elbow at the angle; jugal not obliquely expanded but developing a postorbital ridge or process which forms the only upward projection from the arch—the posterior projection in *rufa*, formed by the thickened anterior end of the squamosal, being absent; audital bullæ, particularly the long bony tubes, much smaller; auditory meatus much smaller and more nearly a complete circle, with notch on upper side smaller and narrower.

Measurements.—Type specimen: Total length 350; tail vertebræ 35; hind foot 55.

Aplodontia major rainieri subsp. nov.

Type from Paradise Creek, south side Mt. Rainier, Washington (alt., 5200 ft.). No 90144 ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected August 6, 1897, by Vernon Bailey. Orig. No. 6122.

Characters.—Similar to *A. major* but paler and grayer throughout, particularly the underparts and region around mouth; whiskers mainly white instead of black; audital tubes smaller; incisive foramina shorter and slightly more open; basioccipital notch shallower; jugal narrower and more slender throughout.

Measurements.—Type specimen: Total length 375; tail vertebræ 33; hind foot 62.

Thomomys melanops sp. nov.

Type from timberline at head of Soleduc River, Olympic Mts., Washington. No. 90630 ♀ ad. U. S. Nat. Mus., Biological Survey Coll. Collected Aug. 28, 1897, by Vernon Bailey. Orig. No. 6219.

Characters.—Size small; coloration as in *T. mazama*—nose, space round eye and large postauricular patch (embracing ear) slate black in strong contrast to dull chestnut of upper parts; under parts dark plumbeous, washed with buffy fulvous; feet and wrists white. *T. douglasi* from the north side of the Columbia River has the entire head reddish chestnut, concolor with the back, but in cranial characters agrees best with the present species.

Cranial characters.—Skull similar to that of *douglasi* but smaller; interparietal shorter posteriorly, barely notching supraoccipital; mastoid bullæ smaller: basioccipital less excavated by audital bullæ; anterior root of zygoma (seen from above) broader and more squarely truncate, infringing more on frontals.

Measurements.—Type specimen: Total length 206; tail vertebræ 63; hind foot 27.

Thomomys douglasi yelmensis subsp. nov.

Type from Tenino, Yelm Prairie, Washington. No. $\frac{31916}{43777}$ ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 24, 1891, by C. P. Streator. Orig. No. 1385.

Characters.—Similar to *T. douglasi* but very much paler; face with the dark markings of the mountain species.

Cranial characters.—Skull like that of *douglasi* but interparietal larger; frontals depressed interorbitally; angle of mandible standing out farther and projecting anteriorly so as to form a distinct hook; incisors broader and thicker.

Measurements.—Type specimen: Total length 222; tail vertebræ 68; hind foot 32.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON THREE GENERA OF DOLPHINS.

BY T. S. PALMER.

In looking over a list of the genera of Cetaceans recently, my attention was called to several names of doubtful validity which are still in common use. These names are *Neomeris*, *Orca*, and *Tursio*, now applied to members of the Delphinidæ, but which are preoccupied in other groups.

Neomeris, based on *Delphinus phocænoides* Cuvier, from the Cape of Good Hope, was described by Gray in 1846,* but the name had been previously used by Lamouroux in 1816 for a genus of polyps.† In 1891 both Blanford and Lydekker mentioned that *Neomeris* was unavailable for a genus of mammals, but not considering the group sufficiently distinct did not rename it. True, in 1889, gave *Neomeris* full generic rank in his 'Review of the Family Delphinidæ' (pp. 114, 178), and this course has been followed by Trouessart.‡ As the group is likely to be recognized either as a genus or subgenus, it should receive a name, and may be called *Neophocæna* from its close relationship to *Phocæna*, the well known genus of porpoises.

For half a century the killers have been placed in the genus *Orca* established by Gray in 1846 in the same paper in which he named *Neomeris*. A somewhat careful search has failed to reveal any earlier use of *Orca* for this group, but the name proves to have been originally proposed by Wagler in 1830* to include two ziphioid whales, *Delphinus bidentatus* Hunter and *D. desmarestii* Risso. *Orca* is therefore untenable for the genus to which it is generally applied, unless it can be shown that it was so used prior to 1830. It becomes incumbent on those who wish to preserve *Orca*, to show that it was originally applied to the killers, otherwise the earliest available name seems to be *Orcinus* of Fitzinger,† and the common species will stand *Orcinus orca* (Linn.).

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* Zoöl. Erebus & Terror, p. 30, 1846.

† Hist. Polypiers coralligènes flexibles, 1816.

† Catalogus Mammalium, fasc. V, p. 1042, Nov., 1898.

Tursio is one of the unfortunate names which have been given to several different groups. It was applied by Gray, in 1843, to the group of dolphins of which *Delphinus tursio* is the type, but afterwards when it was discovered that Wagler had previously used *Tursio* for *Delphinus peronii* Lacépède of the southern seas, it was transferred to this group, while Gray's *Tursio* was renamed *Tursiops* by Gervais. *Tursio* proves to have been used still earlier by Fleming, in 1822,‡ for a group of sperm whales, including *T. vulgaris* and *T. microps* (= *Physeter microps* Linn.). These species are not now recognized, and it is doubtful whether any such species exist, but this does not alter the fact that Fleming applied, or intended to apply, the name to a genus of Physeteridæ, thereby precluding its use in any other group. Both *Orca* and *Tursio* as originally used are apparently synonyms of other genera and therefore drop out of use. The genus to which *Tursio* has been applied by True and other recent authors has for its type *Dolphinus peronii* and has received no less than four distinct names: *Tursio* Wagler, 1830, *Lissodelphis* Gloger, 1841, *Delphinapterus* Gray, 1846, and *Leucorhamphus* Lilljeborg, 1861. *Tursio* and *Delphinapterus* are both preoccupied, and *Leucorhamphus* is simply a new name for *Delphinapterus*. *Lissodelphis* § seems to be the first available name for the genus, and the species therefore becomes *Lissodelphis peronii* (Lacépède).

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* Nat. Syst. d. Amphibien, p. 34, 1830.

† Wiss.-Populäre Naturgesch. Säugethiere, VI, pp. 204-217, 1860.

‡ Philosophy of Zoology, II, p. 211, 1822.

§ Gloger, Hand-u. Hilfsbuch d. Naturgeschichte, p. 169, 1841.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF NEW BIRDS FROM NORTHWESTERN MEXICO.

BY E. W. NELSON.

The birds here described were obtained during the past few months by Mr. E. A. Goldman while making collections in western Mexico for the Biological Survey of the U. S. Department of Agriculture. A number of birds from southwestern Sonora show closer relationship to forms peculiar to the Cape St. Lucas region of Lower California than to races of the same species in southern Arizona. This is well illustrated by several House Finches from Alamos, Sonora, which are scarcely distinguishable from typical *Carpodacus mexicanus ruberrimus* from Lower California. This interesting relationship between the birds of the mainland and those of the peninsula is somewhat similar to that which exists between certain species found near San Blas, Tepic, and their representatives on the Tres Marias Islands.

In addition to the birds named in the present paper, several others have been described from Sonora, south of Guaymas. These are Mr. Brewster's *Psittacula cyanopyga pallida*, *Thryophilus sinaloa cinereus*, and *Polioptila nigriceps restricta* (Auk, VI, pp. 85–98, 1889), and *Callipepla gambeli fulvipectus* Nelson (Auk, XVI, pp. 26–27, 1899), all from Alamos. The result of the comparatively small amount of work on the birds of this region seems to indicate the existence there of a minor faunal area of comparatively limited extent.

I am indebted to Mr. Robert Ridgway, curator, and Dr. Chas. W. Richmond, assistant curator of birds, in the National Museum, for continued courtesies during the preparation of this paper.

Amazona albifrons saltuensis subsp. nov. Blue-crowned Parrot.

Type No. 164257, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from Camoa, Sonora, Mexico. Collected January 16, 1899, by E. A. Goldman.

Distribution.—Northern Sinaloa and southwestern Sonora, Mexico.

Subspecific characters.—Compared with specimens of *A. albifrons* from the coast of Oaxaca and Guerrero, the birds from southwestern Sonora may be distinguished by the greater width of blue area on crown, the strong wash of blue over back and sides of neck, and the lighter wash of same over rest of back and on all of under parts; thus giving the plumage a bluish-green cast instead of the oil-green back and apple-green under parts of the presumably typical birds from farther south. No appreciable difference in size.

*Dimensions of type.**—Wing 185; tail 97; culmen 25; tarsus 18.

Antrostomus goldmani sp. nov. Goldman's Whippoorwill.

Type No. 164310, ♀ ad., U. S. National Museum, Biological Survey Collection, from vicinity of Mazatlan, Sinaloa, Mexico. Collected April 7, 1899, by E. A. Goldman.

Distribution.—Known only from the type locality.

Specific characters.—Most like *Antrostomus ridgwayi* but larger and paler, with the buffy collar around back of neck narrower. Tarsus feathered only on upper third.

Color.—Top of head and nape pale, brownish drab-gray, with a narrow median line formed of irregular black shaft streaks; feathers on sides of crown and nape with fine black shaft streaks; a grayish white stripe from top of orbit back along sides of nape; ear coverts mottled brownish, bordered below by a narrow line of white; chin and throat grayish brown with the feathers on chin finely mottled with blackish and on lower throat with narrow subterminal black bars and broad white tips; immediately back of this, a collar of golden buffy completely encircling neck; shoulders, back, rump, and upper tail coverts dark gray, finely mottled with pale brown and with distinct shaft streaks of black, heaviest on upper tail coverts; primaries dull black, with large spots of rich fulvous buffy on both webs, and mottled near tips with gray; secondaries blackish coarsely mottled with gray and fulvous buffy; outer web of outer scapulars dull blackish, finely mottled with gray, with roughly oblong black spots forming part of most of black shaft streaks; these black spots and streaks edged with buffy; inner web of inner scapulars like those already described but adjacent inner and outer webs of middle scapulars pale gray, finely mottled with darker, forming a broad, pale, longitudinal band along middle of scapulars on each side of which extend most of the oblong black shaft spots; tail above very similar to back in general color but more coarsely mottled with black; tail below dull blackish, indistinctly banded and coarsely mottled with gray and buff and narrowly tipped with buff; entire breast gray, finely mottled with pale brown and buffy and with fine black shaft streaks; crissum buffy with irregular black bars, coarser and fewer on under tail coverts.

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* All measurements are in millimeters.

Dimensions.—Wing 163; tail 123; culmen 13; tarsus 18.

General notes.—The crown of *A. goldmani* is much paler than the rest of the back and in the silky gray gloss and pattern of markings closely resembles the crown of a gray specimen of *Nyctidromus albicollis.* It has the same general type of coloration as *A. ridgwayi*, and like it has feathers only on the upper third of the tarsus. Both *A. ridgwayi* and *A. goldmani* are very distinct from *A. salvin.* The latter, although having a very narrow buffy collar around the neck, is a much darker bird with a very different pattern of markings, especially on the wings, and has the upper two-thirds of the tarsus feathered.

Aphelocoma grisea sp. nov. Chihuahua Jay.

Type No. 164250, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from vicinity of Guachochi, in the Sierra Madre of southern Chihuahua, Mexico. Collected September 27, 1898, by E. A. Goldman.

Distribution.—Oak woods in Sierra Madre of southern Chihuahua, Mexico.

Specific characters.—Nearest *Aphelocoma woodhousei* but the head paler blue, back grayer, and crissum white.

Color of type.—Top of head and neck pale grayish blue approaching China blue; entire back dull gray with faint wash of blue; upper tail coverts azure blue; upper surface of wings and tail a little darker blue than crown; ears and sides of head dark gray glossed with blue, especially on cheeks; narrow superciliary streak of white extending back from upper border of orbit; chin and under side of neck to fore breast dull whitish with pale bluish gray streaks; breast and front part of flanks dingy gray shading posteriorly into the white area occupying entire crissum.

Dimensions of type.—Wing 138; tail 140; culmen 24; tarsus 39.

General notes.—*Aphelocoma grisea* may be distinguished from both *A. woodhousei* and *A. cyanotis* by the paler, grayer color of its upper parts, the obsolescence of the streaking on the under side of the neck and fore breast, and the white crissum.

Pipilo fuscus intermedius subsp. nov. Alamos Pipilo.

Type No. 164259, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from Alamos, Sonora, Mexico. Collected December 21, 1898, by E. A. Goldman.

Distribution.—Coast region of southern Sonora and northern Sinaloa, Mexico.

Subspecific characters.—Size intermediate between *Pipilo fuscus mesoleucus* and *P. f. albigula.* Back clearer or more ashy gray than in either *albigula* or *mesoleucus;* crown ordinarily like back with only a trace of rufous; under surface of body much like *mesoleucus* but the flanks a little darker ashy.

Measurements of type.—Wing 93; tail 105; culmen 13.5; tarsus 26.

General notes.—The strongest character of *P. f. intermedius* is the absence of rusty rufous on the crown and the grayer back as contrasted with the rusty crown and brownish gray back of both *mesoleucus* and *albigula*.

Cardinalis cardinalis affinis subsp. nov. Sonora Cardinal.

Type No. 164258, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from Alamos, Sonora, Mexico. Collected January 28, 1899, by E. A. Goldman.

Distribution.—Coast region of southern Sonora and northern Sinaloa, Mexico.

Subspecific characters.—Size of *Cardinalis c. igneus* from which the females may be distinguished by narrower bill, grayer upper parts, and duller or less buffy under parts; dark chin patch absent as in *igneus*. The males scarcely distinguishable from those of *igneus* except by their slenderer bills.

Dimensions of type.—Wing 92; tail 104; culmen 17; width of bill at base 12; tarsus 25.

General notes.—*Cardinalis c. affinis* is much more like *C. c. igneus* of the Cape St. Lucas region than like *C. c. superbus* of southern Arizona and northern Sonora. *C. c. superbus* is a much larger bird and the female is browner above, more buffy ochraceous below, and has a distinct dark chin patch. An adult female from Tucson, Arizona, measures: Wing 104; tail 123; culmen 19; width of bill at base 13.5; tarsus 27.

Cardinalis cardinalis sinaloensis subsp. nov. Sinaloa Cardinal.

Type No. 164375, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from Culiacan, Sinaloa, Mexico. Collected March 18, 1899, by E. A. Goldman.

Distribution.—Coast plains and foothills of central and southern Sinaloa, and probably south to Colima, Mexico.

Subspecific characters.—Size nearly the same as that of *Cardinalis c. igneus*, but bill longer and slenderer; color of male lighter and more vivid red; color of female above, darker and grayer but with more red on wings and tail; below darker and more brownish fulvous with an indistinct dark grayish chin patch. Compared with *C. c. superbus*, size much smaller; male brighter, more carmine red; female—above, darker gray, below darker, more brownish fulvous. The female differs from that of *C. c. affinis* in its smaller size and much darker and more brownish fulvous color of under parts.

Dimensions of type.—Wing 87; tail 96; culmen 18; tarsus 26.

Arremonops superciliosa sinaloæ subsp. nov. Mazatlan Sparrow.

Type No. 164388, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from vicinity of Mazatlan, Sinaloa, Mexico. Collected April 6, 1899, by E. A. Goldman.

Distribution.—Coast lowlands of western Mexico from Mazatlan at least to southern border of the Territory of Tepic.

Subspecific characters.—Similar to *Arremonops superciliosa sumichrasti*, but the median line of crown and sides of head more ashy; foreback distinctly shaded with ashy and rest of back clearer and less olive green; under parts paler and less buffy. Median and superciliary crown streaks darker ashy than in typical *superciliosa*, the rufous lateral stripes paler; chin and throat much paler and less buffy—about as in *sumichrasti;* back a little grayer.

Dimensions of type.—Wing 65; tail 56; culmen 13; tarsus 20.5.

General notes.—By a slip of the pen in the 'Auk' for April, 1898, p. 157, I placed *A. sumichrasti* as a subspecies of *rufivirgata*. In fact it is a subspecies of the quite distinct *A. superciliosa*, which (with all its subspecies) belongs to the west coast of Central America and Mexico. *A. rufivirgata* and its subspecies belong to the east coast.

Basileuterus rufifrons caudatus subsp. nov. Sonora Warbler.

Type No. 164260, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from vicinity of Alamos, Sonora, Mexico. Collected January 3, 1899, by E. A. Goldman.

Distribution.—Southwestern Sonora and northern Sinaloa, Mexico.

Subspecific characters.—Similar to *Basileuterus rufifrons jouyi* from which it differs in the paler and more restricted rufous area on crown; rather paler gray of back; more fulvous color on crissum combined with shorter wing and longer tail and tarsus.

Dimensions of type.—Wing 51; tail 60; culmen 10; tarsus 23. Type of *B. r. jouyi.*—Wing 52; tail 56; culmen 9; tarsus 20.

Thryothorus felix pallidus subsp. nov. Mazatlan Wren.

Type No. 164270, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from Chacala, Durango, Mexico. Collected February 27, 1899, by E. A. Goldman.

Distribution.—Arid tropical region of western Mexico, from northern Sinaloa and western Durango to southwestern Puebla and northern Guerrero, Mexico.

Subspecific characters.—Generally similar to typical *T. felix*, but slightly smaller, with upper parts less rufous and more olive brown; tail paler brown, with much more distinct black bars; under parts paler, and under tail coverts barred with dingy whitish and black instead of rufous brown and black.

Dimensions of type.—Wing 56; tail 53; culmen 14; tarsus 21.

General notes.—*Thryothorus felix* was described from southwestern Oaxaca. We have a winter specimen taken at Ometepec, Guerrero, so near the type locality both in distance and climatic conditions that I am safe in considering it typical, and have used it as such in the foregoing comparison. Numerous specimens from Tepic, Sinaloa, and western Durango agree with the type of *Thryothorus f. pallidus.*

Heleodytes stridulus sp. nov. Brown-backed Wren.

Type No. 164261, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from Sierra de Choix, northeastern Sinaloa, Mexico. Collected October 16, 1898, by E. A. Goldman.

Distribution.—Arid mountain slopes of northeastern Sinaloa and adjacent parts of Sonora, Mexico.

Description of type.—Crown blackish brown, darkest on forehead; superciliary stripe from bill to nape white, washed with fulvous brown; loral and postocular stripe blackish; cheeks from gape dingy whitish; malar stripe black; sides of neck dingy whitish, streaked with dull blackish and thinly washed with dull fulvous; back and scapulars burnt umber brown, marked with irregular white shaft streaks and obscure blackish spots; upper tail coverts transversely barred with umber brown, black and whitish; outside of wings marked with spots of umber brown, black and whitish; middle tail feathers ashy brown, indistinctly and narrowly barred with blackish; lateral feathers black, with dingy ashy tips and a series of brownish white spots along outer webs; chin, throat, breast, and middle of belly white, faintly washed with brown and spotted on breast and flanks with black; flanks posteriorly and entire crissum cinnamon brown, brightest on under tail coverts.

Measurements of type.—Wing 75; tail 76; culmen 19.5; tarsus 24.

General notes.—This species is nearest *H. gularis*, from which it is easily distinguished by the blackish brown crown, blackish postocular stripe, and darker brown back. The black spots on breast and flanks are rounded instead of being mainly pointed anteriorly (and thus subtriangular), as in *H. gularis*. Typical specimens of *H. gularis* in the Biological Survey Collection from the Sierra Nevada de Colima, southern Jalisco, and from the Sierra Madre of southern Sinaloa and the Nayarit Mountains of Tepic, just west of Bolaños, outline the known range of this species, and the specimens from the mountains of Sonora referred to *H. gularis* by Salvin and Godman (Ibis, 1889, p. 235) are, no doubt, referable to *H. stridulus*.

Myadestes obscurus cinereus subsp. nov. Sonora Solitaire.

Type No. 164262, ♀ ad., U. S. Nat. Mus., Biological Survey Collection, from mountains near Alamos, Sonora, Mexico. Collected January 3, 1899, by E. A. Goldman.

Distribution.—Arid mountains of southern Sonora and adjacent part of Sinaloa, Mexico.

Subspecific characters.—Most like *M. yadestes o. insularis* but with the ashy gray of upper parts even paler than in that form and extending farther down over fore back: rump and middle tail feathers clearer ashy and interscapular area less suffused with brown. Under parts much as in *M. o. occidentalis* but clearer ashy, with white area on abdomen more restricted than in *insularis*.

Measurements of type.—Wing 104; tail 104; culmen 11.5; tarsus 20.

General notes.—This form equals *Myadestes o. occidentalis* in size but is much paler, and is, in fact, the palest known subspecies of *M. obscurus*. The present record extends the range of this species far north along the west coast of Mexico. *M. townsendi* is the resident species in the high pine forests of the Sierra Madre of northwestern Mexico, the present form belonging to the lower, drier ranges between the Sierra Madre and the coast.

Catharus olivascens sp. nov. Chihuahua Thrush.

Type No. 164263, ♂ ad., U. S. Nat. Mus., Biological Survey Collection, from the Sierra Madre, Chihuahua (65 miles east of Batopilas), Mexico. Collected September 30, 1898, by E. A. Goldman.

Distribution.—Known only from the type locality.

Description of type.—Top of head and nape raw umber brown; sides of head and neck hair brown, underlaid with pale buffy; back, including scapulars and rump, olive brown, contrasting with color of crown and nape; outside of wings and upper tail coverts similar to, but browner than back; tail grayish brown washed on exposed parts with tawny olive; chin, throat and upper part of breast, pale creamy buff, streaked or mottled with hair brown shaded with olive; rest of breast, abdomen, and under tail coverts white; upper part of flanks pale grayish brown.

Measurements of type.—Wing 91; tail 77; culmen 13; tarsus 31.

General notes..—This species is most closely related to *Catharus occidentalis fulvescens* Nelson, but the colors of the upper parts are much more olivaceous, the throat and middle of breast deeper buffy with heavier gray markings, and the wash of gray on the sides of the body much more restricted, leaving a larger area of pure white. The bill is longer and slenderer and the tarsus shorter. The presence of a species of *Catharus* in Chihuahua extends the range of the genus far north of any former record, and was unexpected after my unsuccessful efforts, during the summer of 1898, to find the bird in Durango and extreme southern Chihuahua.

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TWO NEW GLOSSOPHAGINE BATS FROM THE WEST INDIES.*

BY GERRIT S. MILLER, JR.

Examination of material in the United States National Museum proves that there are at least three species of the Glossophagine genus *Phyllonycteris* in addition to the slightly known *P. poeyi*. One of these, *P. sezekorni* Gundlach,† is confined to Cuba, the second occurs in the Bahamas, and the third is thus far known from Puerto Rico only.‡ To the kindness of Dr. J. A. Allen I owe the opportunity of examining two skulls of *Phyllonycteris sezekorni.*

The three species may be distinguished by the following synopsis:

Zygomatic arch incomplete; braincase high but forming no angle with dorsal outline of rostrum; rim of anterior nares thick, not flaring; no distinct lachrymal swellings; depth of mandible about one-sixth length; crown of first lower molar only slightly longer than that of first premolar; color light yellowish brown.................... *P. sezekorni.*

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† Monatsber. K. Preuss. Akad. Wiss., Berlin (1860), p. 818, December, 1860.

‡ Since this paper has been in press, Mr. D. G. Elliot has sent me for examination the *Phyllonycteris* from San Cristobal, Santo Domingo, which he recorded in 1896 as *P. poeyi* (Field Columbian Museum Publication 11, Zoölogical Series, I, No. 3, p. 82, May, 1896). The single skin represents a species closely related to *P. bombifrons* of Puerto Rico, but probably distinct. In the absence of satisfactory material it would be useless to attempt to define the form.

Zygomatic arch complete; braincase forming an angle with dorsal outline of rostrum; rim of anterior nares variable; lachrymal region distinctly swollen; depth of mandible about one-seventh length; crown of first lower molar nearly twice as long as that of first premolar; color variable.

Braincase rising above plane of rostrum at angle of about 12°; rim of anterior nares thick, not flaring; teeth large; anterior border of tragus entire; back light clay color ....*P. planifrons.*

Braincase rising above plane of rostrum at angle of about 30°; rim of anterior nares thin, distinctly flaring; teeth small; anterior border of tragus with several fleshy projections near tip; back dark brown.......*P. bombifrons.*

Phyllonycteris planifrons sp. nov.

Type, adult ♂ (in alcohol), No. 62517, United States National Museum, collected at Nassau, New Providence, Bahamas, March 18, 1886, by James E. Benedict.

General characters.—See synopsis.

Ears.—The ears are moderately long; laid forward they reach about three-fourths of the distance from eye to nostril. Anterior border of conch strongly convex immediately above base, then nearly straight to narrowly rounded off tip. Posterior border faintly concave immediately below tip, convex through lower half. The posterior border terminates abruptly close in front of meatus, and almost directly below anterior base. Six or seven transverse ridges on inner side of conch near posterior border. A small but conspicuous wart on cheek in front of lower base of ear. Anterior border of tragus much thickened, nearly straight, though slightly convex near middle and slightly concave below tip. Tip pointed. Posterior border with four jagged projections, of which the two lower are largest and the two upper occasionally obsolete.

Muzzle and chin.—Main portion of noseleaf oval, considerably broader than high, ill defined over upper lip, the free edge finely crenulate. At middle of upper part of free edge is a well defined upright projection, the height of which above general outline of oval is about equal to distance between inner borders of nostrils.

Nostrils near outer edges of noseleaf, opening upward, forward and slightly outward.

Behind the noseleaf and separated from it by a deep groove is an irregular but well-developed horseshoe-shaped ridge, the ends of which blend with the glandular upper lip.

Chin divided by a deep groove, narrow below, wide above, from the sides of which spring four to six small, fleshy projections.

Membranes.—The membranes are thick and leathery; the wings and propatagium broad and ample; the uropatagium greatly reduced (only 10 mm. wide at base). Propatagium extending along forearm to join thumb at distal end of metacarpal. The membranes are practically naked throughout, as the fur of the body reaches the wings (both above and below) in a narrow line only.

Feet.—The foot is long and strong, about two-thirds length of tibia. Toes essentially equal in length, the first and fifth slightly shorter than the others. Claws large and sharp, nearly one-third as long as rest of foot. Calcar distinct but reduced to a mere stub 3 mm. in length.

Tail.—Tail slightly longer than foot, a little less than half free from membrane.

Fur and color.—The fur is loose in texture, and only moderately long (about 10 mm. at middle of back). It is closely confined to body, scarcely reaching wings. That of head covers external basal fourth of ears. Face densely hairy as far forward as ridge behind noseleaf. Chin and noseleaf naked. Lips and ridge behind noseleaf sprinkled with fine, short hairs.

Color of two skins (topotypes) collected June 3, 1884, by C. J. Maynard (Nos. 85 and 86, Miller collection): fur of back whitish gray through basal half, then light clay color faintly tinged with pinkish buff. The pale bases of the hairs appear irregularly at the surface. Ventral surface pinkish buff, the hairs grayish at base. Ears, membranes, and feet light brown. After thirteen years' immersion in alcohol the color of the type does not differ appreciably from that of these skins.

Skull.—The skull of *Phyllonycteris planifrons* differs from that of *P. sezekorni* most noticeably in the presence of very slender but complete zygomatic arches. The rostrum is slightly broader and flatter and the braincase smaller relatively to the size of the skull. The facial profile is straight from external nares to base of proencephalon, where it rises at an angle of about 12°. Proencephalon small, indistinctly marked off from very large mesencephalon. Metencephalon small and slightly outlined. Lachrymal region abruptly swollen. Antorbital foramen placed obliquely over posterior part of second premolar. Bony palate slightly arched, its general form nearly rectangular, the width between penultimate molars about half length. Vacuities behind incisors smaller than in *P. sezekorni*, but distinct. Pterygoids long, the distance from hamular to posterior molar slightly greater than length of tooth row behind canine. The pterygoids are strongly hollowed from within; and the interpterygoid fossa is partly closed in immediately behind the bony palate by the thin shelf-like edges of the pterygoids. Ventral aspect of roof of posterior nares flat. A slight depression on each side of the faint median ridge on basioccipital between audital bullæ. Audital bullæ small and round, their greatest diameter about equal to least width of palate between second premolars. Rim of external nares thick, not flaring. Mandible slender, the depth contained about seven times in greatest length.

The skull of the type measures: greatest length 25; basal length 22; basilar length 20; zygomatic breadth 11; interorbital breadth 4.8; lachrymal breadth 6; mastoid breadth 11; fronto-palatal depth 3.4; depth of braincase from highest point to level of audital bullæ 9.6; maxillary tooth row (exclusive of incisors) 8.4; mandible 16.4; mandibular tooth row (exclusive of incisors) 9.

Teeth.—The teeth are slightly larger than in *P. sezekorni* or *P. bombifrons.* Crown of first upper molar nearly equal in length to that of second and third together. First upper premolar minute, usually closely wedged between canine and second premolar. Second premolar larger than second molar. First lower molar nearly double as long as first lower premolar; second premolar slightly larger than first, which is about equal to third molar.

Measurements (type specimen).—Total length 78; tail vertebræ 17; tibia 22; foot 14; forearm 47; thumb 12; second finger 35; third finger 82; fourth finger 62; fifth finger 64; ear from meatus 19; ear from crown 15; width of ear 13.6; tragus 8.2; width of tragus at anterior base 2 2; height of noseleaf from upper lip 4.6; width of noseleaf 5.

Specimens examined.—One hundred and twenty-four (2 skins), all from the same limestone cave a few miles from the city of Nassau.

Phyllonycteris bombifrons sp. nov.

Type, adult ♂ (in alcohol), No. 86274, United States National Museum, collected in a limestone cave near Bayamon, Province of San Juan, Puerto Rico, January 18, 1899, by Paul Beckwith.

General characters.—See synopsis.

Ears.—In size and form the ears are as in *P. planifrons.* Tragus shorter and broader than in *P. planifrons*, the anterior border strongly convex, and with from one to three pointed outgrowths above middle. Posterior border much more conspicuously denticulate than in *P. planifrons.*

Muzzle and chin.—The muzzle and chin are essentially as in the Bahaman species, but the ridge back of the noseleaf is separated from the latter by a much broader groove, and the fleshy outgrowths from the sides of the groove in chin are more conspicuous.

Membranes, feet, tail, and fur as in *P. planifrons.*

Color.—Both fur and membranes are much darker than in *P. planifrons.* In a specimen (No. 86270) skinned after only two months' immersion in formalin and alcohol, the fur of the dorsal surface is whitish gray through basal two thirds, then mars brown to tip. Ventral surface pale wood brown. Ears, feet, and membranes dark brown.

Skull.—The skull of *Phyllonycteris bombifrons* differs from that of *P. planifrons* in its shorter, narrower, more rounded rostrum, and larger, much more highly arched braincase. The proencephalon rises above the plain of the rostrum at an angle of about 30°. Lachrymal swellings well developed. Audital bullæ smaller than in *P. planifrons*, the greatest diameter of each considerably less than least width of palate between second premolars. *Pterygoids* slightly shorter than in *P. planifrons.* Rim of external nares thin and noticeably flaring. Mandible slender.

The skull of the type measures: greatest length 24.4; basal length 22; basilar length 19.8; zygomatic breadth 12; interorbital breadth 5; lachrymal breadth 6; mastoid breadth 11.4; fronto-palatal depth 3; depth of braincase from highest point to level of audital bullæ 10.4; maxillary tooth row (exclusive of incisors) 8; mandible 16; mandibular tooth row (exclusive of incisors) 9.

Teeth.—Except for their somewhat smaller general size, the teeth of *Phyllonycteris bombifrons* do not differ appreciably from those of *P. planifrons.*

Measurements (type).—Total length 78; tail vertebræ 14; tibia 22; foot 14; forearm 48.4; thumb 14; second finger 38; third finger 81; fourth finger 65; fifth finger 64; ear from meatus 18; ear from crown 14; width of ear 13; tragus 7; width of tragus at anterior base 2.2; height of noseleaf from upper lip 4.6; width of noseleaf 5.

Specimens examined.—Fourteen, all from the type locality.

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A NEW POLAR HARE FROM LABRADOR.*

BY GERRIT S. MILLER, JR.

Certain marked discrepancies are apparent in the measurements of Polar Hares from Labrador and Newfoundland tabulated under the name *Lepus arcticus bangsi* by Mr. Samuel N. Rhoads in his recent 'Synopsis of the Polar Hares of North America.'† They are, however, passed by without comment. On examining the specimens in the United States National Museum, together with a few lent me by Mr. Outram Bangs, I find that these differences are correlated with others, both cranial and external, and that the Labrador Polar Hare is readily separable from true *Lepus bangsi* (Rhoads) of Newfoundland. Its relationship to the Polar Hare of Baffin Land, *Lepus arcticus* Ross, is, through the loss of Mr. Kumlien's specimens, less easily determinable. *Lepus arcticus*, however, according to the best testimony, never assumes a complete dark summer coat; while the single skull that I have examined differs from that of any of the Labrador specimens. As the Polar Hare of Labrador cannot be identified with either *Lepus arcticus* or *Lepus bangsi* it may stand as:

Lepus labradorius sp. nov.

1896. *Lepus arcticus bangsi* Rhoads, American Naturalist, XXX, p. 253. March, 1896 (part). Type locality, Codroy, Newfoundland.
1896. *Lepus arcticus bangsi* Rhoads, Proc. Acad. Nat. Sci. Philadelphia, p. 365. August 4, 1896 (part).

Cotypes: Skin No. 14149, United States National Museum, collected at Fort Chimo, Ungava, Labrador, September 28, 1882, by Lucien M. Turner

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† Proc. Acad. Nat. Sci. Philadelphia (1896), pp. 351–376.

(original number 1180); skull No. 32132, United States National Museum, same locality and collector, no further data (original number 2326).

General characters.—Most like *Lepus bangsi* (Rhoads) from Newfoundland, but with shorter hind foot and longer ears. General color of dorsal surface in summer pelage clear hair brown instead of dull broccoli brown as in *L. bangsi.* Audital bullæ more inflated than in *L. bangsi.* Differs from the *Lepus arcticus* Ross of Baffin Land in the completely developed dark summer coat, and apparently in cranial characters also.

Color.—General color of dorsal surface hair brown tinged with bluish gray and frosted with whitish. Head clear, pale, hair brown, lightest on cheeks and darkest on crown and forehead. Ears grizzled black and hair brown anteriorly, whitish posteriorly, black at extreme tip. Sides and rump clear gray (Ridgway, Nomenclature of Colors, Pl. II, No. 8). Belly dull white. Hind feet white above, tinged with brown over bases of toes. Front feet white, strongly tinged with brown. Soles of all four feet light umber brown. Tail snowy white.

Skull.—The skull of *Lepus labradorius* exactly resembles that of *L. bangsi* except in the form of the audital bullæ. These are so much inflated that they rise (when the skull is held upside down) conspicuously above the surface of the basioccipital, and slightly above the level of the highest point of the occipital condyle. In *L. bangsi* the bullæ rise very slightly above the surface of basioccipital, and generally not to level of condyle. The ventral exposure of the bullæ is in *Lepus labradorius* considerably longer than broad, while in *L. bangsi* the length and breadth are nearly equal.

Measurements.—Type: * hind foot 140; ear from crown 100; ear to tip of hairs 108. Another specimen (No. 14793, U. S. National Museum): hind foot 142; ear from crown 105; ear to tip of hairs 110.

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*The type of *Lepus bangsi* measures: total length 626; tail vertebræ 63; hind foot 160; ear from crown 85. (Rhoads.)

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CHAMÆA FASCIATA AND ITS SUBSPECIES.

BY WILFRED H. OSGOOD.

Among the Wren-Tits in the collection of the U. S. National Museum* is a single specimen (No. 3339) which formed part of the original Baird collection and which is labeled in Prof. Baird's writing '*Parus fasciatus* California, Wm. Gambel.' This is the only known specimen of *Chamæa* collected by Gambel, and as such Mr. Ridgway has for some time considered it the type of *Chamæa fasciata* Gambel. The exact locality from which it came is unknown but its characters show conclusively that it belongs to the pale southern form rather than to the dark northern one. This being the case, *Chamæa f. henshawi* becomes a synonym of *C. fasciata*, and it is necessary to provide a new name for the northern coast form heretofore assumed to be typical *fasciata*. The status of the two forms may be summarized as follows:

Chamæa fasciata Gambel. Pallid Wren-Tit.

Parus fasciatus Gambel, Proc. Acad. Nat. Sci., Phila., p. 265, 1845.
Chamæa fasciata Gambel, Proc. Acad. Nat. Sci., Phila., p. 154, 1847.
Chamæa fasciata henshawi Ridgway, Proc. U. S. Nat. Mus., V, 13, June 5, 1882. (Type from Walker Basin, California.)

Type from [southern] California, No. 3339 U. S. Nat. Mus. Collected by Wm. Gambel.

Distribution.—Southern coast and interior of California, including coast valleys and foothills from San Francisco Bay south to northern Lower

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*The Wren-Tits in the U. S. National Museum collection were kindly placed at my disposal by Mr. Robert Ridgway, Curator of Birds.

California; interior valleys and slopes north to head of the Sacramento Valley. Upper Sonoran zone.

Description of type.—Upper parts pale hair brown, shading into grayish on nape and top of head and into olivaceous on rump; flanks pale brownish olive; sides of head, neck and shoulders ashy, slightly paler than crown; a small white spot above and below eye; throat and breast cinnamon rufous; sides washed with cinnamon; belly yellowish white medially; inner web of primaries and secondaries edged with whitish; under wing coverts and axillars pale cinnamon rufous.

Measurements of type.—Wing 59; tail 83; exposed culmen 11; tarsus 25.

Remarks.—The type of *C. fasciata*, though slightly darker than the type of '*henshawi*,' exactly represents the average condition of the southern and interior form. Specimens from the Sacramento Valley, from San Bernardino county and Pasadena do not differ from it in any way. It is possible that the type was taken in San Bernardino County, since it agrees perfectly with specimens from there and Gambel must have passed through that region. Even if the type were not available it would be best to use the name for the southern form, since so far as known, Gambel's collecting in California was confined to the region south of San Francisco.

Chamæa fasciata phæa subsp. nov. Coast Wren-Tit.

Type from Newport, Yaquina Bay, Oregon, ♂ ad., No. 164256, U. S. Nat. Mus., Biological Survey Collection. Collected March 14, 1899, by B. J. Bretherton. Orig. No. 2405.

Distribution.—Coast of Oregon and California from Astoria to Nicasio. Transition zone.

Description of type.—Upper parts almost uniform sepia, darkest on head, becoming bister on rump; tail bister with tinge of olivaceous; flanks about like rump, grading insensibly into sides; lores, cheeks and sides of head dark ashy; a white spot above and below eye; throat, breast, and sides deep brownish rufous; limited area in middle of belly buffy yellow; throat and breast obscurely streaked with dusky; inner web of primaries and secondaries edged with white; under wing coverts and axillars pale cinnamon rufous.

Measurements of type.—Wing 60; tail 79; exposed culmen 10; tarsus 25.

Remarks.—Intergradation between typical *C. fasciata* and *C. f. phæa* occurs in the vicinity of San Francisco Bay. Among the few specimens examined from the region immediately south of San Francisco (Santa Clara, Santa Cruz, etc.) are individuals referable to each form, though the majority are nearest to *C. fasciata*.

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DESCRIPTION OF A NEW LEMMING MOUSE FROM THE WHITE MOUNTAINS, NEW HAMPSHIRE.

BY EDWARD A. PREBLE.

During the latter part of June, 1898, I collected a few small mammals near the village of Fabyans, in the White Mountains of New Hampshire, a short distance west of the base of Mt. Washington. Among these specimens is a small Lemming Mouse, at first supposed to be *Synaptomys fatuus*,* which it greatly resembles externally. An examination of the skull, however, shows the animal to belong to *Mictomys*, a subgenus hitherto unrecorded from the eastern United States.†

On comparing this specimen with the type of *Synaptomys* (*Mictomys*) *innuitus*, it was at once apparent that it represented an undescribed form, which may be characterized as follows:

Synaptomys (Mictomys) sphagnicola sp. nov.

Type No. 96543, ♂ adult, U. S. Nat. Museum, Biological Survey Collection. Collected at Fabyans, New Hampshire (near base of Mt. Washington), June 29, 1898, by Edward A. Preble. Original number 2402.

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* Described by Mr. Outram Bangs (Proc. Biol. Soc. Wash., X, p. 47, 1896), from Lake Edward, Quebec, and since recorded from Maine, New Hampshire, and New Brunswick.

† The following references comprise all the published eastern records for *Mictomys*, each referring to a single specimen:

True, Proc. U. S. Nat. Mus., XVII, No. 999, p. 242 (advance sheet Apr. 26), 1894. Original description of *Mictomys innuitus* from Ft. Chimo, Ungava, Labrador.

Bangs, Proc. Biol. Soc. Wash., XI, p. 238, 1897. Record of a specimen of *Synaptomys* (*Mictomys*) *innuitus* (not typical) from Hamilton Inlet, Labrador.

General characters.—Larger than *S. innuitus*, with larger skull and longer hind foot and tail.

Color of type.—Upper parts sepia brown, quite thickly interspersed with black-tipped hairs, the fur basally blackish slate; each side gland marked with white; under parts grayish white; inside of ears slightly darker than general color of upper parts; a few hairs at base of ears and on sides of cheeks, light chestnut; tail quite sharply bicolored, the upper and lower sides concolor with body.

Cranial characters.—Compared with the type of *Synaptomys innuitus*, which is approximately of the same age, the skull of *S. sphagnicola* is much larger and longer; interorbital constriction considerably longer and narrower; rostrum longer and stouter; braincase more lengthened posteriorly; posterior production of zygomata straighter; incisive foramina much larger and slightly longer proportionally; post-palatal pits deeper and median ridge correspondingly conspicuous; audital bullæ longer and more rounded; pterygoids more diverging; mandible larger and stouter, with condylar processes broader proportionally.

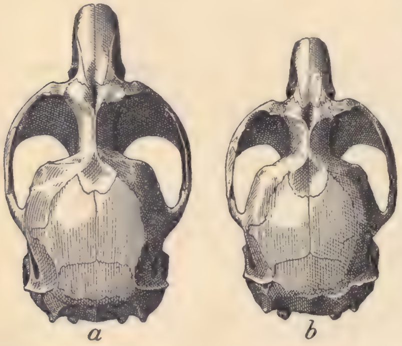

Fig. 3.—*a*, Type skull of *Synaptomys* (*Mictomys*) *sphagnicola*; *b*, type skull of *Synaptomys* (*Mictomys*) *innuitus*. × 1½.

Dental characters.—Compared with *S. innuitus*, the molars are heavier and molar series considerably longer; enamel pattern of molars not essentially different, though the posterior prism of the last upper molar is more triangular. Inner faces of the upper incisors much excavated medially, with the edges exterior to the sulci about one millimeter longer than remaining portion of the teeth, and ending in sharp points. Enamel faces of incisors paler orange than in the type of *S. innuitus*.

Measurements.—Type of *S. sphagnicola* (in flesh): total length 132; tail vertebræ 24; hind foot 20. Type of *S. innuitus* (in alcohol): total length 115; tail vertebræ 17; hind foot 17.5.

Cranial measurements of type.—Occipito-nasal length 27.5; basilar length 26; zygomatic breadth 16; mastoid breadth 12; interorbital constriction 28; length of nasals 8; length of incisive foramina 5.5; upper molar series, 7. Type skull of *S. innuitus* (No. 24729, U. S. Nat. Mus.): occipitonasal length 19.6; basilar length 18.3; zygomatic breadth 15; mastoid breadth 11.5; interorbital constriction 3.1; length of nasals 6.3; length of incisive foramina 4.8; upper molar series 6.5.

General remarks.—The discovery of a species of *Mictomys* in the White Mountains, within the limits of the Canadian Zone, and at a comparatively low altitude (about 1,600 feet) is one of the many surprises that modern methods of collecting have brought to light, even in this thickly settled region. The type and only known specimen was taken near the banks of a small stream (called on some maps Dartmouth Brook), which leisurely winds its way through a piece of swampy ground well grown up to alders and other small trees, just before losing itself in the noisy Ammonoosuc. The carriage road leading from Fabyans to the base of Mt. Washington crosses the brook at this point after covering about a mile of its course. To the left of this road, where my collecting was done, the ground is swampy and quite densely carpeted with moss, through which spring many grasses and swamp-loving plants, overtopping, to a great extent, the logs, stumps, and fallen trees with which the ground is strewn.

My traps, set here for three nights, captured numerous specimens of meadow mice (*Microtus*), woodmice (*Peromyscus*), short-tailed shrews (*Blarina*), red-backed mice (*Evotomys*), two species of jumping mice (*Zapus hudsonius* and *Z. insignis*), in addition to the *Synaptomys* here described. The *Synaptomys* was taken in a runway in the moss, beneath a small fallen tree.

Whether this species is a wanderer from the Hudsonian Zone on the neighboring mountains, guided thence by that ideal highway, a mountain stream, or whether it is a regular inhabitant of the Canadian Zone throughout this region, is an interesting question, to be solved by future investigations.

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THE EYE OF *BYBLIS SERRATA*.

BY SYLVESTER D. JUDD, Ph. D.

Byblis serrata is an Amphipod Crustacean, which belongs to the family *Gammaridæ*, but has totally different eyes from *Gammarus*. A pair of these eyes projects from either side of the cephalon and any one of them calls to mind the vertebrate eye, because it has a biconvex lens and a fluid-filled space with a retina below. A section through the chief axes of the eye of *Byblis* would first show a large lens, which has been secreted in concentric shells by a thickened layer of lentigen, Fig. 4, *l*. continuous on either side with the thinner hypodermis *h*, which is gorged with scarlet pigment that envelops the eye like a cornucopia, thus shutting out all the rays that might reach the retina without first passing through the lens. Under the lentigen is a humor space, *s*. Below and proximal to this space is a layer of columnar cells, *x*, which is continuous on either side with the hypodermis. This layer of cells has secreted a strong cuticula on its outer boundary, which borders on the space, and just proximal to this layer are the omatidia (which, of course, lack the corneal cuticula). The most distal element of an omatidium is a granular columnar body (cell product), *r*. Below and proximal to this body, the remainder of the omatidium with its refractive cone and retinula is practically identical with the omatidium of *Gammarus*, minus of course, the corneal cuticula, for in the retinula of both crustaceans there are five retinal cells with pigment and four rhabdomeres.

Methods.

The material employed in studying the eye of *Byblis serrata* was obtained at Mr. Alexander Agassiz's laboratory, at Newport,

R. I., during the summer of 1893, by skimming the surface of Narragansett Bay with a tow-net at night. Various killing reagents were tried, but the majority of specimens used and those giving the best results were killed in Kleinenberg's picro-sulphuric acid. Sections were cut on a Minot-Zimmerman microtome and stained with Kleinenberg's hematoxylin diluted with two parts of 70 per cent alcohol, and then decolorized in acid alcohol for ten minutes. This work was done under the direction of Dr. E. L. Mark, of Harvard University.

STRUCTURE OF THE EYE.

Byblis serrata possesses two pairs of crater-like eyes. One pair is a little anterior to the other, and also somewhat nearer the sagittal plane of the animal. The axis of the anterior pair makes a very acute angle with the chief axis of the body, pointing forward and upward. The ventral pair of eyes points downward and backward. In the living animal both pairs of eyes have a bright red appearance, owing to the presence of a large amount of red pigment surrounding the lens.

The component parts of the eye are best seen in sections passing through the chief axis. Beneath the thickened cuticula which constitutes the single lens is the succession of cell layers and cell products, which collectively form a roughly spherical mass, connected at its deep end by nerve fibers with the optic ganglia. Unlike the eyes of most Crustacea, which are the type known as compound eyes, in which clusters of cells called omatidia, acting independently of one another, are provided each with its own proportion of modified cuticula, the eyes of *Byblis*, although composed of clusters of cells, in some ways comparable with omatidia, nevertheless have but a single lens, so that they have a superficial resemblance to the eyes of spiders and other arachnids.

After I had studied this new and peculiar type of eye in detail, Della Valle's paper* on the '*Gammaridæ* of the Gulf of Naples' appeared, containing a figure and description of this same type of eye. The amphipod studied by Della Valle was *Ampelisca*, a genus closely allied to *Byblis*, but the author had not been able to resolve the omatidium into its separate elements. In *Ampelisca*, as shown by Della Valle's figure, the rods and cones differ slightly in shape from those of *Byblis*. Further, there is no pigment in the hypodermis adjoining the lens. In the lentigen of *Ampelisca* the nuclei are proportionately much larger than in *Byblis*, and the

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*A complete bibliography of the literature on the eyes of amphipods will be found at the end of Dr. G. H. Parker's masterly paper entitled 'The Compound Eyes in Crustaceans' (Bull. Mus. Comp. Zool., XXI, 1891). The only recent histological paper on the eyes of amphipods of the family *Gammaridæ* is in Antonio Della Valle's 'Gammarini del Golfo di Napoli' (Fauna und Flora des Golfes von Neapel, XX, pp. 108–112, Tav. 46, Figs. 4–6, 1893).

lens shows no stratification. But the great and important differences are that the eye of *Ampelisca* has no humor space, lacks the middle layer of the eye of *Byblis*, while the latter possesses pigment, middle layer, and fluid-filled space.

DETAILS OF HISTOLOGICAL ELEMENTS OF THE EYE.

Lens.—The lens is about the same size in each of the four eyes. Its outline is almost exactly circular in a surface view, and the curvature of the superficial and deep surfaces is nearly the same, Fig. 4, *len.* The lens, which is only a modification of the cuticula, shows even more plainly than the latter its composition of successive layers, the markings being as is commonly the case in lenses which are strongly convex, more or less concentric.

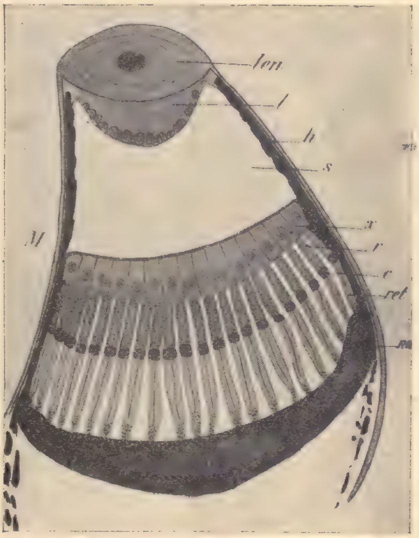

FIG. 4.—Diagrammatic section of right eye of posterior pair, slightly obliquely transverse to chief axis of body: *len*, lens; *l*, lentigen; *h*, hypodermis; *s*, space; *x*, middle layer of cells; *r*, rods; *c*, cones; *ret.*, retinulæ; *nu*, nuclear region of retina. × 350.

Lentigen. — There are three distinct layers beneath the lens, which in passing from the surface to the deeper portions I shall call respectively lentigen, middle layer, and retina. The lentigen consists of a single layer of elongated cells which radiate more or less regularly from the lens as a center, Fig. 4, *l.* They are of unequal lengths, those of the center being longest, and those nearer the margins of the lens successively shorter, so that the deep surface of the lentigen is usually hemispherical with a tendency to a conical form. The transition to the unmodified hypodermis is nevertheless quite abrupt. The nuclei of the lentigen cells are closely crowded in a single layer at the deep surface of the lentigen—often so closely that they are nearly twice as long as broad They are granular and have distinct nuclear membranes. The hypodermis underlying the cuticula that surrounds the lens is filled with roughly spherical granules of pigment. The hypodermal cells form a single layer of epithelium, but the pigment obscures this structure to such an extent that it is almost impossible to make out the cell boundaries. In some sections, where this layer has been ruptured, nuclei are found which are supplied with a well defined membrane surrounding granular contents. So far as the nuclei are concerned, these pigmented hypodermal cells do not differ materially from the adjacent hypodermal cells that are lacking in pigment, Fig. 5, *h*.

Space.—Below the lentigen is a large space, which, in the living animal, is probably filled with fluid, for in none of my preparations is there any trace of structural elements. A conception of the form of this space may be obtained by taking a truncated cone of plastic modeler's clay and thrusting into the truncated surface a sphere, and supposing that there is a convexity corresponding to this hemispherical depression bulging out from the base of the cone. This modified truncated cone (the *space*) has its base formed by the slightly curving distal surface of the cells of the *middle layer*, Fig. 4, *x*, and the truncated surface is depressed by the inwardly projecting hemispherical lentigen, Fig. 4, *l*.

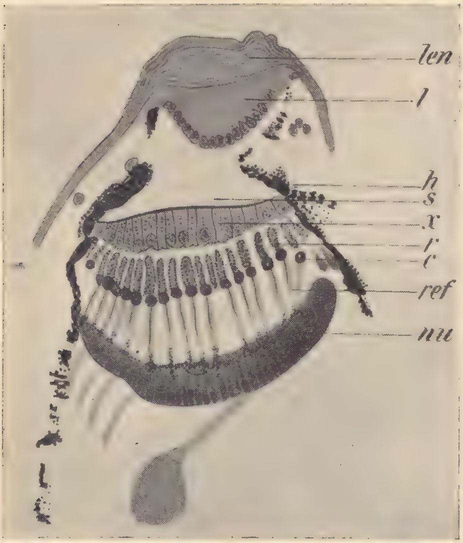

FIG. 5.—Section of left eye of the posterior and ventral pair, transverse to axis of body. Lens crinkled and hypodermis ruptured (abbreviations as in Fig. 4). × 300.

That this space is not artificially produced by shrinkage and consequent separation of the lentigen from the middle layer of cells is sufficiently evident from the constancy of its presence and form, but even more certainly from the fact that the deep surface of the lentigen and the outer surface of the middle layer cannot be imagined to have been in contact, for if they had been, such separation would have produced ragged ruptures and given conditions not shown in my series of slides.

Middle layer.—Below and proximal to the *space* is a single layer of columnar cells, Fig. 4, *x*. Like the lentigen, this layer is thickest in the middle, and diminishes very gradually and uniformly in thickness toward the margin. The contents of these cells are granular. The nuclei are situated in the proximal ends of the cells, and have coarsely granular contents and very faint, if any, nuclear membranes. The cells have remarkably well-defined cell walls. That this layer was not attached to and subsequently torn away from the lentigen by the microtome knife seems to be clearly shown by the fact that this middle layer has secreted on its distal surface bordering the space a thick cuticular-like structure.

Turning now to the parts of the eye lying proximal to the middle layer of cells, we notice that in all these deeper portions, which apparently correspond to the rods, cones, and retinulæ of Della Valle, there seem to be no nuclei, except those lying at the proximal or bottom part of the eye, which is clearly the nuclear region of the retina. The omatidia embrace at least the rods, cones, and retinulæ.

Rods.—The rods lie immediately beneath and proximal to the middle layer of cells, from which they are separated by a distinct line. The rods, Fig. 4, *r*, are somewhat more numerous than the cells in the middle layer. They are columnar, about as tall as the longest cells of the middle layer, but some of the marginal ones are shorter. The rods are coarsely granular. In oblique frontal sections through the chief axis of the eye there is an indication that each rod may possibly be made up of two parts.

Cones.—Beneath and proximal to each rod, and in close connection with it, is a crystalline cone, Fig. 4, *c*, which has a rounded cubical form and is highly refractive. Each cone is homogeneous except for a white space that usually occurs within its body. These spaces often have the appearance of more or less spheroidal cavities or vacuoles, but such vacuoles generally indicate the plane of separation between the two component parts of the crustacean cone. This apparent resolution of the cone into two parts seems to be indicated in cross-sections by two opposite sharp indentations of the outline.

Retinulæ.—Closely adhering to each cone is a bundle of five fusiform elements, Fig. 4, *ret.* The bundle at a deep level becomes resolved into its separate elements, and at a still deeper level closely packed nuclei of the retinula cells are found, Figs. 4 and 5, *nu.* These nuclei, which are completely filled with deeply stained granules, are flask-shaped. A cross-section through a fusiform bundle shows five granular retinula cells clustered about a highly refractive rhabdome composed of four rhabdomeres. At the place where the bundles are resolved a considerable amount of pigment is seen. In a cross section five μ thick each retinal cell contains about two grains of pigment. Nerve fibers have been traced from the optic ganglia to the region of the nuclear layer of the retina, but the exact connection with the retinal cells was not clearly seen.

CONCLUSIONS.

The eye of *Byblis serrata*, with its large lens, humor space, and complex omatidia, seems to be a compound eye built on the general plan of a simple ocellus, but also furnished with a space whose function may be like that of the vitreous humor space of the vertebrate eye. The true significance of this peculiar eye awaits the deft touch of the embryologist, who, in taking up this sense organ, will certainly enter a field where much is to be learned concerning the morphology of the arthropod eye.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW FOSSIL BEAR FROM OHIO.*

BY GERRIT S. MILLER, Jr.

The United States National Museum has recently purchased from Mr. W. G. Roberts, of Middletown, Ohio, the skull of an extinct bear found by workmen on the farm of a Mr. Sommers, near Overpeck Station, on the C. H. & D. R. R., four miles from Hamilton, Butler County, Ohio. In regard to the discovery of the specimen, Mr. Roberts writes: "The man who found it was digging a well. When twenty-three feet from the surface he found the skull lying on what appeared to be a nest of petrified sticks." Attempts to secure some of these 'petrified sticks' have thus far failed.

The skull, that of a very aged individual, probably a female, represents a species somewhat smaller than a black bear. It lacks the lower jaw, but is otherwise only slightly imperfect. Part of the left zygomatic arch is missing, and the left occipital condyle is broken away. These injuries are of ancient date. The posterior region of the palate was crushed in by the shovel or pick that dislodged the skull from the gravel in which it was imbedded. At the same time the occiput was severely cracked and the right zygomatic arch broken. The pieces, however, fit together accurately. Six teeth remain in place—the canines, the posterior premolars, and the posterior molars. All traces of tubercles had been worn from the crowns of the grinding teeth before the animal's death.

The skull differs from that of any living American bear in its long, low rostrum, deeply concave forehead, small braincase, and large cheekteeth. The extinct North American species hitherto described are *Arctodus pristinus* Leidy, *Ursus amplidens* Leidy, *U. americanus fossilis* Leidy, *Arctotherium simum* Cope, and *Ursus haplodon* Cope. These may be examined chronologically.

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Arctodus pristinus Leidy (Proc. Acad. Nat. Sci. Philadelphia, VII, p. 90, June, 1854), from the sands of the Ashley River, South Carolina, is a small-toothed species in no way closely related to that represented by the Ohio specimen.

Ursus amplidens Leidy (Journ. Acad. Nat. Sci. Philadelphia, N. S., III, p. 168, November, 1856), from "a ravine in the vicinity of Natchez, Mississippi," is known from a penultimate upper molar, and a left mandibular ramus with the posterior tooth in place. The specimen is thus exactly complementary to the Ohio skull. The only common ground for comparison between the two is the size of the molar figured by Leidy and the space formerly occupied by the homologous tooth in the Ohio specimen. Although the two correspond in a general way, this fact alone is obviously insufficient to establish specific identity.

Ursus americanus fossilis Leidy (Journ. Acad. Nat. Sci. Philadelphia, N. S., III, p 169, November, 1856), discovered in the same ravine that contained the remains of *Ursus amplidens*, is a small-toothed bear closely related to the existing black bears, though probably distinct from any recent species.

Arctotherium simum Cope (American Naturalist, XIII, p. 791, December, 1879; *ibid.*, XXV, p. 997, November, 1891), from Shasta County, California, is readily distinguishable from the Ohio specimen by its generic characters and exceedingly short rostrum.

Ursus haplodon Cope (Proc. Acad. Nat. Sci. Philadelphia, 1896, p. 383), from Port Kennedy, Pennsylvania, is a very large animal, the jaws of which "exceed the average dimensions of the grizzly bear." Through the kindness of Mr. Witmer Stone I have been enabled to examine some of the material on which this species was based. This shows that the skull of *Ursus haplodon* was even more massive than that of the grizzly bears, and therefore nearly double the weight of the Ohio specimen, with which, therefore, the species requires no special comparison.

The animal represented by the Ohio specimen, as none of the names based on fossil North American bears are applicable to it, may be called :

Ursus procerus sp. nov.

Type No. 4214, United States National Museum.

General characters.—Skull about as long as that of the black bears (*e. g.*, *Ursus americanus* and *U. floridanus*), but much more slender. Braincase smaller and rostrum larger than in the black bears. Forehead deeply concave. Canine teeth as in *Ursus americanus*, but molars fully as large as those of *Ursus arctos* and the grizzly bears.

Skull.—Viewed from above, the skull of *Ursus procerus* differs from that of *U. americanus* and *U. floridanus* principally in the position of the postorbital processes relatively to the total length of the skull. In the black bears the distance from the tip of the nasals to a line joining the tips of the postorbital processes is contained nearly or quite twice in that from the latter point to inion. In *U. procerus* it is contained barely one and one-half times. Postorbital processes short and blunt. Antinion broader and longer than in *U. americanus*, strongly concave anteriorly, very little elevated laterally and posteriorly. The horizontally expanded basal region of the zygoma is about as broad as in *U. americanus*, but the shelving portion of the squamosal behind the zygoma is much narrower and more concave. The zygomatic arch as a whole stands out more widely from the side of the skull than in *U. americanus*. In this respect it suggests the grizzly bears.

Viewed from the side, the striking peculiarities of the skull become fully apparent. The rostrum is so long, and its dorsal outline so nearly parallel with the alveoli, that, combined with the general length and shallowness of the braincase, it gives the skull a strongly canine aspect. Distance from posterior border of infraorbital foramen to front of premaxilla nearly one and one-half times depth of rostrum through infraorbital foramen. In *Ursus americanus* and *U. floridanus* the same distance scarcely exceeds the depth. The zygomatic arch as a whole does not differ noticeably from that of *U. americanus*, though its anterior base appears to be somewhat more lightly built. Braincase long and low. Occipital condyle larger than in the black bears (fully as large as in *U. horribilis*) and standing out much more conspicuously behind the paroccipital process. Sagittal crest and lambdoid crest well developed, but not unusually large. Inion strongly overhanging.

Viewed from beneath, the most striking peculiarities of the skull of *Ursus procerus* are the length and breadth of the palate and the narrowness of the occipital region. The palate is nearly as long and fully as broad as in the skull of a grizzly bear the basal length of which is 40 mm. greater than that of *U. procerus*. The hinder part of the palate is so much injured that its exact form cannot be determined; but so far as the fragments may be taken as a guide the posterior palatal region did not differ appreciably from the corresponding part of the black bear's skull. Interpterygoid fossa wider than in *Ursus americanus*. Distance from median line of basioccipital to outer side of mastoid process 12 mm. less than in the type skull of *Ursus floridanus* with approximably equal basal length. Audital bullæ smaller than in *U. americanus* and *U. floridanus*, but not different in form. Glenoid fossa as in *U. americanus*.

The occiput, viewed from behind, is narrower and lower than in the black bears. This increases the apparent size of the zygomatic arches.

Teeth.—The teeth are so worn that all trace of their tuberculation is lost. In form they do not appear to differ noticeably from those of *U. americanus.* In size, however, the molars and premolars fully equal those of *Ursus horribilis*, though the canines are no larger than in a specimen of *U. americanus*, and considerably smaller than in the skull of *U. floridanus* to which reference has already been made.

Measurements.—The following measurements were taken with dividers. They therefore in no case follow the outline of the bone.

Greatest length 317. Basal length 290. Basilar length (estimated) 273.

Tip of nasals to line joining tips of postorbital processes 110.

Inion to line joining tips of postorbital processes 173.

Zygomatic breadth 176. Mastoid breadth 124.

Breadth across postorbital processes 97.

Breadth of rostrum across bases of canines 68.

Least breadth of rostrum 63. Lachrymal breadth 75.

Greatest breadth of braincase above roots of zygomata 92.

Fronto palatal depth (opposite anterior base of first molar) 53.

Occipital depth between audital bullæ 80.

Breadth of palate between posterior ends of last molars 45.

Breadth of palate at (and including) anterior ends of last molars 79.

Least breadth of palate between second premolars 45.

Length of palate from gnathion to plain of posterior edges of last molars 130. Greatest width of interpterygoid fossa 32.

Length of glenoid fossa 48. Length of occipital condyle 36.

Breadth of occipital condyle 16.6. Length of audital bulla 40.6.

Canine at edge of alveolus 20 x 13. Diastema 21.

Distance from anterior edge of large premolar to posterior edge of last molar (crowns) 73. The same (alveoli) 72.

Crown of large premolar 16 x 13. Alveolus of anterior molar 21.8 x 15.4.

Space between crowns of large premolar and posterior molar 23.

Crown of last molar 36 x 18.8.

Remarks.—*Ursus procerus* represents a type of bear, quite different from those found among living members of the genus, characterized by elongation and depression of the rostrum accompanied by reduction in the braincase. While the rostrum is lengthened and broadened to dimensions equal to those of the corresponding parts in the grizzly bears, its depth is even less than in the black bears, which the animal as a whole probably resembled in size. Though the canines are small, the molar teeth are probably relatively larger than in any other known bear. This disproportion in the sizes of the canines and molars may be partly sexual, if I am right in supposing that the type skull is that of a female. The characters of the skull and teeth are all opposed to those of the species of *Arctotherium.* With the other extinct American bears no close comparison can be made. *Ursus procerus* is not nearly related to the living black bears or grizzly bears. Of neither of these can it be regarded as a directly ancestral type.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW MOOSE FROM ALASKA.*

BY GERRIT S. MILLER, Jr.

The Moose of Alaska has long been known to be the largest of American deer, but hitherto it has not been directly compared with true *Alces americanus*. During the summer of 1898 Mr. Dall De Weese, of Cañon City, Colorado, spent three months on the Kenai Peninsula, Alaska, in quest of large mammals for the United States National Museum. Of the Moose, the special object of his search, he secured four males and two females. These specimens show that the Alaskan Moose differs considerably from the animal inhabiting the eastern United States and eastern and central Canada. To the latter the specific names *americanus*,† *lobatus*,‡ and *muswa* § have been applied. I can find no name, however, based on the Alaskan animal, which may be called:

Alces gigas sp. nov.

Type adult ♂ (skin and skull), No. 86166, United States National Museum, collected on the north side of Tustumena Lake, Kenai Peninsula, Alaska, in September, 1898, by Dall De Weese. Original number 16.

General characters.—A larger, more richly colored animal than the eastern moose. Skull with occipital portion narrower, palate broader, and mandible much heavier than in *Alces americanus*.

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† *Alces americanus* Jardine, Naturalists' Library, XXI (Mammalia—Deer, Antelopes, Camels, &c.), p. 125, 1835. Eastern North America.

‡ *Cervus lobatus* Agassiz, Proc. Boston Soc. Nat. Hist., II, p. 188, 1846. Eastern North America.

§ *Alces muswa* Richardson, Zoöl. Voyage of H. M. S. 'Herald,' Vertebrals, p. 102, 1852. Central Canada.

Color.—General color a grizzle of black and woodbrown darkening along spine and changing abruptly to clear black on chest, buttocks, and lower part of sides. Median line of belly hairbrown. Legs hair-brown or broccoli-brown with darker shading. Head like back, but more finely grizzled. Ears yellowish white internally, broccoli-brown externally.

Skull and teeth.—The skull of *Alces gigas* differs from that of *A. americanus* in its larger size and greater massiveness, as well as in certain details of form. Chief among the latter is the great breadth of the palate, relatively to the length of the toothrow. In three males of *A. gigas* the ratio of least palatal breadth (between anterior premolars) to length of toothrow is respectively 47.1, 47.1, and 44.7. In three males of *A. americanus* it is only 36, 36, and 39. In this respect *Alces gigas* resembles *Alces alces*, though the Alaskan animal shows no approach to the conspicuous deepening of the antorbital portion of the skull, or the peculiar form of the premaxillary characteristic of the European species. The occiput is relatively higher and narrower than in *A. americanus.* In two males of the latter the ratio of depth between inion and lower lip of foramen magnum to greatest width across paroccipital processes is 68.5 and 72.2, while in three of *A. gigas* it is 81.8, 84.8, and 87.5.

Measurements.—Of the following tables of measurements the first is based on data furnished by Mr. De Weese. The skull of *Alces americanus*, measurements of which are given in the second, is that of a very large individual from Maine, considerably older than any of the specimens of *A. gigas.*

External Measurements of Alces gigas.

Number and sex.	86162 ♀	86163 ♀	86164 ♂	86165 ♂	86166 ♂
Tip of nose to base of tail	2550	2562	2946	2946	3048
Tail vertebræ	76.2	88.9	101	101	101
Ear from crown	255.7	297	304	304	304
Height at shoulder	1955	1930	2032	2032	2034
Shoulder to hip	1574	1651	1701	1727	1752
Depth of body at shoulder	812	851	914	927	965
Circumference of body at center	2032	2082	2184	2235	2286
Tip of nose to angle of mouth	152.4	177.8	177.8	179	177.8

Cranial Measurements of Alces gigas and A. americanus.

Number and sex	*Alces gigas.*			Type	*A. americanus.*
	86163 ♀	86164 ♂	86165 ♂	86166 ♂	14646 ♂
Greatest length	615	635	645	633	600
Basal length	570	570	596	570	560
Basilar length	556	550	574	550	535
Tip of premaxilla to tip of nasal	275	280	290	285	268
Median palatal length	355	380	390	380	360
Tip of premaxilla to alveolus of first tooth	230	240	236	230	225
Greatest breadth including orbits	218	234	245	245	221
Least breadth including orbits	168	190	200	206	180
Least width between antlers	.....	190	170	180	165
Least width of frontals between orbits and antlers	.....	205	210	225	195
Greatest antorbital breadth	133	168	168	172	127
Zygomatic breadth	203	218	223	228	203
Mastoid breadth	147	165	172	168	170
Greatest width of palate including toothrows	143	142	150	156	142
Least width of palate including toothrows	105	110	118	110	98
Greatest width of palate between toothrows	90	93	95	101	88
Least width of palate between toothrows	68	69	67	70	53
Upper toothrow (crowns)	147	143	150	154	147
Distance between tips of paroccipital processes	85	92	100	95	80
Greatest width across paroccipital processes	.....	165	160	165	175
Distance from inion to lower lip of foramen magnum	.....	135	140	140	120
Depth between antlers	122	146	155	143	132
Greatest expanse of antlers	.....	1530	1600	1580	1330
Expanse between uppermost points	.....	1200	1140	1120	760
Width of palmation	...	310	360	360	380
Least diameter between burr and first tine	.....	175	210	200	172
Length of mandible	470	.....	485	480	460
Depth of mandible at posterior end of toothrow	59	62	58	65	59
Greatest depth of mandible	223	230	235	223	225
Least depth of mandible	30	31	31	34	27
Diastema	180	180	182	183	170
Mandibular toothrow (crowns)	158	152	160	165	160

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PROCEEDINGS

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FERNS OF THE DISMAL SWAMP, VIRGINIA.

BY WILLIAM PALMER.

The ferns of the Dismal Swamp may be divided into three distinct groups according to their place of growth: (1) arboreal species, (2) true swamp species, and (3) ground species. The first group may be divided into two subdivisions: (*a*) those growing on fallen mossy trunks, about the bases of living gum trees, on dead cypress knees, bent gum roots, and on decaying stumps; (*b*) those growing exclusively on trunks and branches of living trees. The first subdivision (*a*) comprises the following species: *Dryopteris marginalis*, *D. spinulosa*, *D. goldieana celsa*, *Polystichum acrostichoides*, *Asplenium platyneuron*, *Struthopteris regalis*, *S. cinnamomea*, *Botrychium obliquum*. The second subdivision (*b*) contains but one species, *Polypodium polypodioides*, which grows exclusively on the trunks and larger branches of living trees, usually high up in the tops, and probably on all the species of deciduous trees. The true swamp ferns include but two species, *Woodwardia virginica* and *W. areolata*, which grow on the peaty remains of former vegetable life, always in wet places and often, especially the former, in water.

The ground ferns occur, not in the true peaty swamp, but in the surrounding low sandy area, which nevertheless constitutes a very large portion of the Dismal Swamp. These are *Dryopteris noveboracensis*, *D. thelypteris*, *Asplenium filixfœmina*, *Pteris aquilina*, *Onoclea sensibilis*, *Struthopteris regalis*, *S. cinnamomea*. But one fern ally (*Selaginella apus*) has been found.

A study of many forms of the life of this vast swamp reveals the interesting fact of the occurrence in abundance of many southern and northern types. It is a meeting ground where many Austroriparian forms reach their northern limit, while more northern forms either find their lowest or most southern habitat, or have variously changed representatives. The causes of this complex condition vary according to the requirements of the different species and the circumstances of their introduction into the area. In a general way it may be stated that species requiring abundance of sunlight and living above the undergrowth are southern, while those intimately associated with the surface of the swamp are of more northern, or of higher-ground derivation. But there are many exceptions. The swamp undoubtedly has been slowly evolved from a salt-water lagoon to its present condition; hence all its present life has been introduced from surrounding regions.

Of the ferns *Polypodium polypodioides* is distinctly Austroriparian, here reaching almost its northern limit.* *Dryopteris goldieana celsa*, though related to an Alleghenian form, is quite distinct and is undoubtedly its representative. The woodwardias are coastal-swamp species, and though found well into New England do not occur at any great elevation. The two species of *Struthopteris* are most abundant at higher altitudes and owe their presence here to their swamp habits and the ability of the plantlets to find a congenial home. They do not fruit abundantly and doubtless before man interfered with the forest were rare. Seven other species, *Dryopteris marginalis*, *D. noveboracensis*, *D. thelypteris*, *Polystichum acrostichoides*, *Asplenium filixfœmina*, *Pteris aquilina*, *Onoclea sensibilis*, are all higher-ground species. With the exception of *D. marginalis* they are abundant in the general region bordering the swamp. *Botrychium obliquum* also belongs in the same category and may be common about the swamp. Two other species usually found on higher and dryer ground, *Dryopteris spinulosa* and *Asplenium platyneuron*, are not abundant in the swamp, and the former was noticed but once elsewhere. Both are somewhat changed from the typical form, though perhaps hardly sufficiently to warrant separation.

Thus the only species growing on living trees is truly Austroriparian; the next is *D. goldieana celsa*, which occupies a higher habitat in the swamp than any of the others except *D. spinulosa*, which occurs with it, though not so abundantly, and which has also undergone some change on account of its unusual environment.

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* I have taken it near Cape Charles City, Northampton Co., Va.

The flooded condition of the true peaty swamp floor for several months of the year prevents the growth of ground ferns, except the water-loving woodwardias; therefore all the species of the swamp proper which grow near the ground occur just above the high-water line and rarely more than three feet above it.

A systematic examination of the whole swamp for ferns has not been possible, but enough has been learned to show that a number of species have adapted themselves to very unusual conditions, and that some have undergone changes from the normal type. The main factor in determining the character of the pteridophytic life is the flooded condition of the swamp floor for several months annually, but this is less potent now than formerly.

LIST OF SPECIES.

1. **Botrychium obliquum** Muhl. Oblique Grape Fern.

On June 10, 1899, I found four plants, growing with other species on logs, at the side of Washington ditch. They were sterile fronds of the previous year's growth. The fronds are less ample and the divisions shorter, more rounded and more widely placed than in any specimens from about Washington. The dried roots are stronger, blacker, and more abundant.

2. **Struthopteris** * **regalis** (Linn.) Bernh. Royal Fern.

Osmunda regalis Linn., Sp. Pl. p. 1065, 1753.

Abundant, usually in large clumps scattered throughout the swamp and always on dead stumps except in the sandy areas.

In many cases hundreds of dead persistent stipes testify to the great age of the clumps. Just above high-water mark mosses have established a foothold in a broad ring around the old knees of the cypresses, the bends of gum roots, and logs. Various plants, especially ferns, take root in this moss and often reach a large size. The oddity and beauty of such growths are striking, especially on a well-preserved knee where the reddish apex rises several inches above the surrounding moss. (See plate I, Fig. 7.)

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* The ferns usually placed in *Osmunda* evidently belong to Bernhardi's genus *Struthopteris* (not *Struthiopteris* of authors). The essential features of Bernhardi's description are as follows: 21. Struthopteris mihi. *Sporangia* subglobosa, bivalvia. E. g. *Osmunda regalis.* L. — — *Cinnamomea.* L. — — *Claytoniana.* L. * * *. Obs. 2. Caue ne Struthopteridem meam cum Struthiopteride Hall, confundas. (Journ. für die Botanik, Band 2, 126, 1801.)

When little sunlight reaches these plants fruiting spikes are rarely seen, and usually but one on a plant. Along the outlet canal, where the trees have been thinned and drainage is complete, the dryer and more sunny conditions have affected the fruiting and many variations showing partial fertility were collected.

3. **Struthopteris cinnamomea** (Linn.) Bernh. Cinnamon Fern.

Osmunda cinnamomea Linn., Sp. Pl., p. 1066, 1753.

Abundant, usually with the preceding species, but not so partial to the cypress knees and the shadier situations. Both species, but more especially *S. cinnamomea*, are evidently recent additions to the true swamp flora; far away from the ditches and bogie roads they are rarely seen. This species is usually very tall and luxuriant, but does not fruit as extensively as in more open and higher places. On June 9, 1899, I found two plants near the head of Washington ditch in an open place. They had all the pinnules much reduced in size and many of the lower basal ones were greatly elongated and often pinnatifid. The plants were exposed to generous sunlight for part of the day, but owing to their situation on a decaying log were necessarily limited in root moisture.

4. **Onoclea sensibilis** Linn. Sensitive Fern.

By no means common in the sandy area but found mainly in the streams and ditches bordering the swamp.

5. **Polystichum acrostichoides** (Michx.) Schott. Christmas Fern.

On June 3, 1896, several hundred yards from the eastern end of Lake Drummond, I found several dwarfed plants on a small well-decayed log. The largest frond, a fertile one, measured $9\frac{1}{4}$ inches (235 mm.*) and $1\frac{3}{4}$ in. (44) wide, with a stipe $4\frac{7}{8}$ (124) long. The longest pinna is $\frac{7}{8}$ (21.5) long and $\frac{1}{4}$ (5.5) wide. The largest sterile frond was shorter and barely wider. The edges of the pinnæ were regular but very finely spinulose. No others were found, but the species is common in the ravines near Suffolk, about fourteen miles distant.

6. **Dryopteris noveboracensis** (Linn.) A. Gray. New York Fern.

Where the sandy areas of the swamp blend with the true peaty swamp, and especially in the old bogie roads in these dryer portions of the swamp, this species is abundant.

7. **Dryopteris thelypteris** (Linn.) A. Gray. Marsh Fern.

Found at but one place, above the head of Washington ditch. Its long spindling fronds were growing in the bushes on the bank, but the normal plant was not seen.

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*All measurements in parentheses are in millimeters.

8. Dryopteris goldieana celsa subsp. nov. Log Fern.

(Pl. I, Figs. 1–6, 8–12.)

Structurally similar to *Dryopteris goldieana goldieana* (Pl. I, Figs. 13, 14), but differing in its very erect habit, longer and narrower fronds with smaller and more widely separated pinnules and pinnæ, and with the apex regularly decreasing instead of crowded and suddenly shortened. Upper basal pinnules of lower pinnæ either absent or very much and usually unequally reduced. Fronds lanceolate or lanceolate oblong. Stipes at base densely covered with large and richly alutaceous scales with brown centers and transparent, sharply defined margins; upper scales paler and almost unicolor. Type No. 340,398 National Herbarium, Dismal Swamp, Norfolk County, Virginia, June 8, 1899, William Palmer (collecor's No. 247). Measurement of type, frond $22\frac{1}{2}$ inches (523); longest pinna, the 5th, $5\frac{3}{8}$ (136.5); stipe 12 (305). Fertile pinnæ less than $1\frac{1}{4}$ (31.5) wide; sterile basal pair, greatest width $1\frac{3}{4}$ (44.5).

Measurements of twenty paratypes: Fronds 10–24 inches (254–609), average 19 (483). Stipes: 7–$14\frac{1}{2}$ (178–368.5), average $10\frac{1}{2}$ (267). Largest frond 24 (609.5); stipe $10\frac{1}{4}$ (261); longest pinna, the 8th, $4\frac{7}{8}$ (124; the lowest pinna 4 (101.5). Sterile fronds few, much smaller and less elongate. Three lower pairs of pinnæ of fertile fronds sterile or nearly so.

In habit, situation, and aspect this fern is quite unlike typical *D. goldieana*. It suggests *D. floridana** but differs in outline; its pinnules are not so widely separated, and the shape of the lower pinnæ, especially the two lowest, are quite different, as shown in Figs. 6 and 9–12.

Its relationship to *goldieana* is shown by the character of the scales at the base of the stipe (quite unlike the *cristata* group), by the reduced size of the basal pinnules on the lower pinnæ, the lower one being absent, by the broadest portion of the lower pinnæ not occurring at the base, and by the peculiar stalked character of the rachides of the pinnæ, especially the basal pair. Though occurring in a swamp it is practically a plant of dry habitat, as compared with the broad herbaceous *D. goldieana*, which grows on damp ground. The difference is well shown by comparing the tall and narrow *D. cristata*, characteristic of dryer ground, with the large, coarse *D. cristata clintoniana*, which grows in wetter places. This apparent paradox is rendered plain by the statement that *celsa* does not grow on the ground of the swamp but in moss on stumps and logs where the supply of moisture is limited and where the plants are exposed to a fair, often abundant amount of light. *D. goldieana* grows in damp, rich and well shaded situations. Both these plants are densely covered about the bases of the stipes with large dark brown centered scales, almost black in *goldieana*, most of which are bordered by a narrow, transparent ribbon, the contrast between the two portions being sharply defined.

In *celsa* the rachis is grooved in front even to the apex, but in *goldieana* it is stouter, more fleshy and grooved for only a short distance above the lower pinna, or faintly further.

**Dryopteris floridana* bears the same relation to *D. cristata*, or rather to *D. c. clintoniana*, that *D. g. celsa* does to *D. goldieana*.

In *D. cristata*, *floridana* and in *clintoniana* the basal pinnules of all the pinnæ are largest and longest; in *celsa* and *goldieana*, some pinnæ, especially the apical ones, are similar, but the lower pinnæ, especially the lowermost, have the pinnules, even for several pairs, very much reduced. In good fertile fronds of *celsa* and *goldieana* the lower basal pinnule of the lowest pair of pinnæ is always absent but sometimes present or apparently present in some undersized fronds. This is often the case in *goldieana*, but only occurs rarely in *celsa*. The basal pinnules of the upper pinnæ of both these ferns are always opposite and very exactly so, but they begin to diverge at the centers of the pinnæ. On the lower pinnæ this pairing is rare and it is not easy to determine whether the opposite of the reduced upper basal pinnule has never been developed or whether it is represented by the one occupying the adjoining position. This latter view would seem to be correct, the lower pinnules having been gradually moved along the rachis toward the tip during the evolution of the form. In very young fronds (Figs. 5, 8) there is a wide space of the lower pinna beneath, the pinnule seems forced away from the rachis and the base of the midvein inclines toward the rachis of the pinna for some distance. The same result is shown in numerous young fronds of both forms. Fig. 14 represents the common type of *goldieana*, while Figs. 6 and 9–12 are from specimens of *celsa*.

Dryopteris goldieana is extremely herbaceous and robust, its pinnules and pinnæ being large and often overlapping. In *celsa* they are always widely separated; both are much narrower, and there is no sudden change from the long. wide pinnæ to the shorter, narrower one of a crowded apex as in *goldieana*. The reduction or absence of the lower pinnules results in producing a stalk for the pinnæ, short in *goldieana*, longer in *celsa*. The pinnæ of *celsa* incline upwards very decidedly, whereas in *goldieana* they stand at a right angle to the rachis or are only slightly inclined upwards. These differences between the very erect narrow *celsa* and the broad, drooping and herbaceous *goldieana* result from differences in habitat, the dryer and lighter situation of *celsa* contrasting in its results with the gloomy, damp habitat of *goldieana*.

On July 30, 1899, I found two clumps of *goldieana* on the Virginia bluffs of the Potomac river opposite Cabin John Bridge. The first contained over fifty plants, all with well drooping fronds and nearly all the lower pinnules of the lower pinnæ normal. These plants were growing at the foot of the talus among the rocks, and the trees formed a dense canopy overhead. In the second clump a mile further down, in a precisely similar situation, were several dozen plants. But here the thinness of the foliage overhead permitted the sun to shine on the plants for several hours daily. The early fronds were drooping as in the first clump, but the later and mostly fertile fronds were more erect, and the divisions were less herbaceous and consequently less crowded, but in no case to the same extent as in *celsa*.

The differences in the character of the lower basal pinnules in these two ferns is ecologically an interesting feature. The usual character of these pinnules in *goldieana* is shown in Fig. 14. In Fig. 13 is shown another, which was growing in bright sunlight, at Great Falls, Virginia; the shortening of the lower pinnules is evident. The first style of frond grows in damp well-shaded situations and droops in such a way that a practically equal amount of light is received by all portions of its upper surface. But a difference occurs when the light is more abundant; then the frond becomes strengthened, that is, more erect, and consequently the upper and middle portions shade the lower pinnæ. A struggle thus ensues between the pinnæ for light. The lowermost, owing to their position, are seriously handicapped, but instead of remaining in the same or nearly the same plane, as in the case of well-shaded fronds, these lower pinnæ turn more toward the light, so that their tips approach each other and their upper surfaces are turned nearly 90 degrees, so as to obtain the light as nearly as possible perpendicular to their plane. In pressing such specimens the stalks of one or more pinnæ are necessarily fractured where they join the stipe. In thus bringing the lower pinnæ almost together in order to obtain the greatest amount of light the greater portion of each pinna is entirely successful, but at the expense of the lower pinnules; especially so on the lowest and less so toward the middle. These lower pinnules are shaded not only by their own overlapping when the pinnæ are flexed, but also by the stout stipe and the pinnules above. Consequently they do not receive a normal amount of light and therefore during the growing period fail to develop perfectly, and are outstripped by the more fortunately placed middle pinnules. One extreme is shown in the usual frond of *goldieana*, the other in nearly every frond of *celsa*. Specimens of *goldieana* collected about Washington, an intermediate locality, altitudinally and geographically, have these basal pinnules in many cases much, and often unequally, reduced, but never to the extent of *celsa*. Similarity of general structure and the ecological character of the differences between these two ferns warrant the view that *celsa* is a true subspecies of *goldieana*, and therefore a geographical race or physiological subspecies. Our swamp plant therefore is a product of abundant light, limited root moisture, and the struggle for existence under peculiar conditions, which do not, or but very slightly, affect its relative.

In June, 1896, near the head of Washington ditch, I found a few immature plants of *celsa* and considered them *D. c. clintoniana*. The following year, at the same place, I found some larger but imperfect fertile fronds. This year, while penetrating the swamp north of the outlet canal and about eight miles east of the other locality, I found numerous plants ranging, through all stages, from those with the first fronds and the remains of the prothalli, to plants over thirty inches high. It is possible that this fern occurs in other localities in the same general region.

The log fern grows in several situations. About the base of a large gum tree, where there was an accumulation of waste woody matter and an entanglement of various shrubs and other plants, it was abundant and of all sizes. An odd location, and the most common, was along the curved lower side of a fallen mossy trunk where the plants occupied a line just above high-water mark. Usually such a log was exposed to a large amount of light and its upper surface was destitute of mosses and other plants. On other logs usually situated in a tangle and well shaded, the ferns grew in a line along the middle of the top, either with several plants of *D. spinulosa*, a few flowering plants, or more generally alone. In every instance the rhizome was imbedded in the moss and the plants were but loosely attached to the wood; a pull on a frond was generally sufficient to bring up the whole plant.

9. **Dryopteris marginalis** (Linn.) A. Gray. Marginal Fern.

A most unexpected surprise was the discovery on June 10, 1899, of a single dwarfed plant of this rock-haunting fern. Four miles westward from Lake Drummond up Washington ditch, is a recently made plank road which runs a mile or more into the swamp. Some distance along this road a large tree had fallen years before, and on its broken and decaying stump I found the plant with five fronds, three of which were fertile. The largest measures 8⅝ inches (219.5), and the stipe 5⅝ (142.5). The sori are not abundant and are confined to the apex. There are 279 on the best fruiting frond.

10. **Dryopteris spinulosa** (Retz) Kuntze. Spinulose Fern.

A few large plants were growing on logs with *D. g. celsa* and several immature plants were found near the head of Washington ditch on logs and stumps. They differ from specimens taken about Washington, D. C., in having all the divisions narrower and more widely separated and the apex lengthened. The color is a darker green. The pinnules are more inclined toward the rachis, and the pinnæ trend upward to a greater extent. Some specimens, both large and small, show a more triangular outline, with longer lower pinnæ, and this is evidently the tendency in plants growing in deep shade. In June, 1896, the mouth of a well near Suffolk had many plants growing between the bricks. All were herbaceous and dwarfed, and the single fertile one found had very small sori near the margin.

11. **Woodwardia virginica** (Linn.) J. E. Smith. Virginia Chain-fern.

Extremely abundant. Its natural habitat is in the pools which occur between the elevations made by the enlarged bases of the trees, and in the cane swamps; but wherever the swamp has been burnt out this fern occurs in greater luxuriance. Along the ten miles of Jericho ditch which has been dug from Lake Drummond through the northern part of the swamp, it is very abundant and large, and grows in the water in dense beds usually for many yards. The fronds are here quite erect and face the sun—*i. e.*, the plane of the frond is at a right angle to the line of average duration of direct sunlight received by the frond ; so that the plants on the east side of the ditch face toward the southwest, while those on the west side approximate the southeast, often to the east, according to the amount of foliage about them. The largest frond collected measures 2 feet 10¼ inches (970), its jet black stipe is 2 feet 9¼ inches long (955) and greatly enlarged at the base. At the outlet canal at the east end of Lake Drummond, where the depth of the canal has drained the adjoining swamp, it is abundant but harsh and less herbaceous, and was found fruiting abundantly in early June. Plantlets were common.

12. **Woodwardia areolata** (Linn.) Moore. Narrow Chain-fern.

Abundant and growing with its relative except in dryer situations. It is common in low places in the swamp, among the cane and other vegetation and about the bases of the trees. Its delicate fronds grow best where well protected from the sun either by taller vegetation or in wet, densely crowded or well-shaded situations. Prothallium fronds and young plants are numerous on small decaying logs which are well shaded and constantly wet.

13. **Asplenium platyneuron** (Linn.) Oakes. Ebony Spleenwort.

Near the western end of Washington ditch a dozen or so plants of various sizes were found growing on well-shaded stumps near the water and mixed with numerous other plants. The fronds are all much broader and longer than specimens of similar age from higher and dryer altitudes, and are more deeply and irregularly incised. The pinnæ are wider apart, broader, more blunt, and the basal portion overlaps the rachis. The largest frond measures 18¾ inches long (476), the longest pinna is 1⅝ inches (41.5), and the stipe is $3\frac{7}{16}$ inches (88).

14. **Asplenium filixfœmina** (Linn.) Bernh. Lady-fern.

Common throughout the sandy woods but not seen in the peaty swamp. A green-stemmed form was the only one found.

15. **Pteris aquilina** Linn. Bracken.

Seen but sparingly near the upper end of Jericho ditch, where the dredging has formed an embankment.

16. **Polypodium polypodioides** (Linn.) Hitchcock. Gray Polypody.

Extremely abundant but usually high up in the tree tops. It persists for several years on the fallen trees but finally succumbs. It is abundant on the cypresses standing in Lake Drummond, where its usually dry curled fronds may be reached from a boat. In the woods it is rarely found where it can be easily reached. In the streets of Suffolk it is abundant in wide bands on the trunks of the shade trees, usually growing in dense masses, mostly on the northern sides and about ten feet from the pavement.

EXPLANATION OF PLATE I.

Figs. 1, 2, 3. *Dryopteris goldieana celsa.* First prothallium fronds, enlarged about twice.

Fig. 4. Second frond of same, natural size.

Fig. 5. Third frond of same, slightly enlarged.

Fig. 8. Fourth frond of same, reduced one-third.

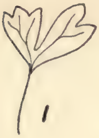
Figs. 6, 9, 10, 11, 12. Lower basal pinnules of same, reduced one-third.

Fig. 13. *Dryopteris goldieana goldieana.* Lower basal pinnules, from poorly shaded frond, reduced one-third.

Fig. 14. The same, from an ordinary frond.

Fig. 7. Plants growing in moss on a dead cypress knee above high-water mark.

Figs. 1–5 were drawn from the fronds; Figs. 6 and 8–14 from tracings of photographs, the fronds being used as negatives.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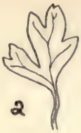
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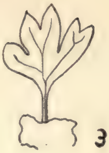
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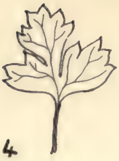
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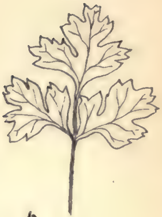
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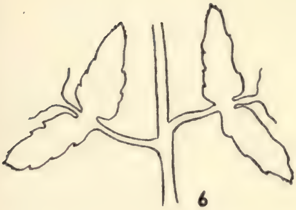
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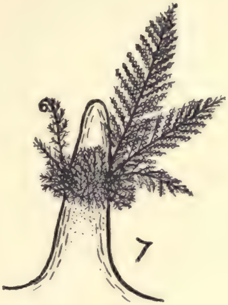

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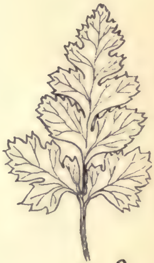
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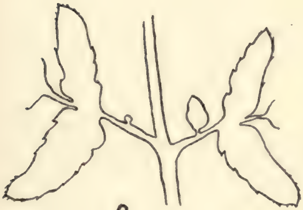
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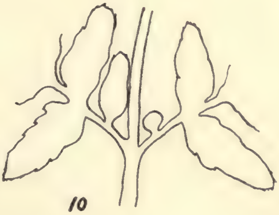
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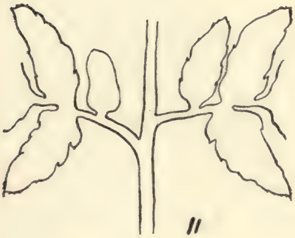
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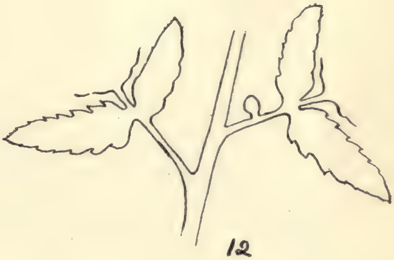
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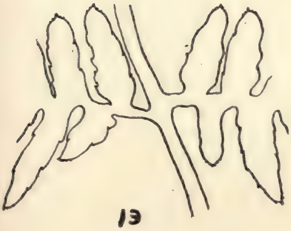
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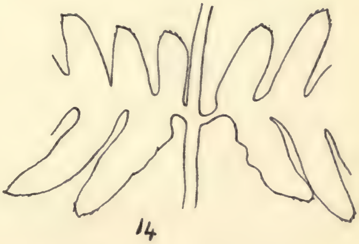
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FIGS. 1-6, 8-12. DRYOPTERIS GOLDIEANA CELSA

FIGS. 13, 14. DRYOPTERIS GOLDIEANA GOLDIEANA

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON *TATOUA* AND OTHER GENERA OF EDENTATES.

BY T. S. PALMER.

Some months ago Mr. Gerrit S. Miller, Jr., published a paper entitled ' Notes on the Naked-tailed Armadillos,'* in which he showed that three generic names had been proposed for the group: *Xenurus* by Wagler in 1830, *Tatoua* by Gray in 1865, and *Lysiurus* by Ameghino in 1891. These names were all based on *Dasypus unicinctus* Linnæus, and *Xenurus* being preoccupied in ornithology, *Tatoua* was adopted as the proper designation of the genus.

Since the appearance of this paper I have made a list of the genera of Edentates which has brought to light two additional names based on *Dasypus unicinctus*, both earlier than *Tatoua* Gray. These names are *Arizostus*, proposed by Gloger † in 1841, and *Cabassous*, published by McMurtrie ‡ in 1831, only one year after Wagler's *Xenurus*. *Cabassous* (which is credited to Cuvier) is merely a Latinized form of a French term used by Cuvier and Buffon, and taken from a native name. McMurtrie frequently adopted such names in his translation of Cuvier's ' Règne Animal ' and not only transformed them into Latin, but accompanied them by generic diagnoses and brief descriptions of the species. His reasons for adopting this course are explained as follows: " The absurdity of translating into English the technical portion, or the nomenclature, was too apparent to demand a moment's consideration—the genius of our language forbids it. To have left these terms in French would have been inexpedient for self-evident reasons; and the idea of giving a class in Latin, an order in French, &c., presented too revolting a medley. By giving them all in Latin, the common language of science, these objections vanished." (p. IV.)

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* See antea, pp. 1–2.

† Hand-u. Hilfsbuch d. Naturgeschichte, p. 114, 1841.

‡ Cuvier's Animal Kingdom, Am. ed., I, p. 164, 1831.

Cabassous, instead of *Tatoua*, is therefore the earliest tenable name for the naked-tailed armadillos, and the species given by Trouessart, including the one added by Miller, will stand: *Cabassous unicinctus* (Linn.), *C. loricatus* (Natt.), *C. hispidus* (Burm.), *C.* (*Ziphila*) *lugubris* (Gray), and *C.* (*Ziphila*) *centralis* (Miller).

Other French names used by Cuvier for armadillos, which McMurtrie endeavored to preserve by putting them in Latin form, are: *Apara*, based on *Dasypus tricinctus; Cachicamus*, including *D. novemcinctus* and *D. septemcinctus;* and *Encoubertus*, including *D. sexcinctus* and *D. octodecimcinctus.* These names, however, are untenable, as they were only common names prior to 1831, and other generic terms had previously come into use for the groups to which they were applied. Thus *Apara* is antedated by *Tolypeutes* Illiger, 1811, *Cachicamus* by *Tatu* Blumenbach, 1803, while *Encoubertus* is a synonym of *Euphractus* Wagler, 1830, and *Dasypus* Linnæus, 1758.

Thomas* has already called attention to the fact that *Cyclopes* Gray, 1821, is the earliest tenable name for the two-toed anteater (*Myrmecophaga didactyla* Linn.), usually referred to *Cyclothurus.* But as he merely mentioned it in a discussion of the names in Gloger's 'Handbuch,' it has been apparently overlooked, and it may therefore be worth while to refer to it in this connection, as *Cyclothurus* still remains in use. As a matter of fact, *Cyclothurus*, although usually quoted as dating from 1825,† is merely a *nomen nudum* in this reference, and was first published as a valid genus in 1842, in Lesson's 'Nouveau Tableau Règne Animal,, p. 152. There are at least three other genera based on *Myrmecophaga didactyla*: *Eurypterna* Gloger, 1841, *Myrmydon* ‡ Wagler, 1830, and *Didactyles* § F. Cuvier, 1829, which are actually earlier than *Cyclothurus*, so that the latter name is clearly untenable and should give way to *Cyclopes.*

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* Ann. & Mag. Nat. Hist., 6th ser., XV, p. 191, Feb., 1895.

† Thomson's Annals of Philos., XXVI, p. 343, Nov., 1825.

‡ Nat. Syst. d. Amphibien, p. 36, 1830.

§ Dict. Sci. Nat., LIX, p. 501, 1829.

Tamandua, like *Cyclothurus*, is usually quoted from Thomson's Annals of Philosophy (l. c., p. 343). It was, however, merely published in a list of genera as '*Tamandua*, Gray, M. R.,' and the only pretense to a description consists of the letters 'M. R.,' referring to Gray's paper in the London Medical Repository.* This paper contains the following list of edentates:

"Tamanoir, Myrmecophaga. Lin. M. jubata. Lin.
Tamandua, Myrmecophaga tamandua. Cuv.
Ant-eater, Cyclopes, G. Myrmecophaga didactyla. Lin.
Pargolen [sic], Manis. Manis pentadactyla. Lin."

Here *Tamandua* is merely a common name and stands on an entirely different footing from *Cyclopes*. A careful examination of this paper will show (1) that the names in the first column of this list are intended as common names, those in the second as genera, and these are followed by the type or included species; (2) that when the common name is adopted for the genus, it is usually repeated; and (3) that genera are usually (but not always) followed by the authority, *e. g.*, *Myrmecophaga* Lin. and *Cyclopes* G. Thus Tamanoir, Tamandua, Ant-eater, and Pangolin are common names, while *Myrmecophaga*, *Cyclopes*, and *Manis* are genera. The first unquestionable use of *Tamandua* as a genus is in Lesson's 'Nouveau Tableau,' p. 152, 1842, where it is based on *Myrmecophaga tetradactyla* Linn. But as in the case of *Cyclothurus* it is antedated, since *Dryoryx* Gloger, 1841, and *Uroleptes*† Wagler, 1830, were also based on *M. tetradactyla* (of which *M. tamandua* is a synonym). *Uroleptes* has priority over *Dryoryx*, and is apparently the earliest tenable name for the genus.

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* Vol. XV, p. 305, Apr. 1, 1821.

† Nat. System d. Amphibien, p. 36, 1830.

VOL. XIII, PP. 75-78 SEPTEMBER 28, 1899

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW TREEFROG FROM THE DISTRICT OF COLUMBIA.*

BY GERRIT S. MILLER, JR.

In June, 1893, Mr. W. P. Hay added to the known fauna of the District of Columbia † a treefrog which he found in considerable numbers in a marsh at Mount Vernon, Virginia. He presented eighteen specimens of the animal, identified as *Hyla cinerea* (Daudin) (=*H.* '*carolinensis*'), to the United States National Museum. Two years later Mr. Hay collected specimens at Little Hunting Creek, Va. Four of these are now in the National Museum. This frog was first brought to my notice early in June, 1898, when, in company with Mr. A. H. Howell, I heard its notes, strikingly different from those of the other batrachians of the region, at Four Mile Run, Va. A week later seven were captured here by Mr. Howell and Mr. E. A. Preble. Since then we have taken, in the marshes at Four Mile Run and Dyke, a locality between Alexandria and Mount Vernon, Virginia, about thirty individuals, some of which I have had in captivity for over a year. Comparison of these with living examples of *Hyla cinerea* from Bay St. Louis, Miss., shows that the northern and southern forms are readily distinguishable from each other by characters of both form and color. Most conspicuous among these is the normal absence in the northern animal of the stripes on sides and legs so conspicuous in *Hyla cinerea*. It may therefore be called:

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† The 'fauna of the District of Columbia' is generally understood to include that of the region within a radius of twenty miles from the Capitol.

Hyla evittata sp. nov.

Type adult ♂ (in alcohol) No. 26,291, United States National Museum, collected at Four Mile Run, Alexandria County, Virginia, July 15, 1898, by Gerrit S. Miller, Jr., and Edward A. Preble.

Zonal position.—This frog is probably confined to the Upper Austral zone.

Geographic distribution.—While the animal is at present known from the marshes of the Potomac River near Washington only, it is to be looked for near the coast from Chesapeake Bay to Long Island Sound.

General characters.—Like *Hyla cinerea* (Daudin) but with broader, deeper muzzle and normally unstriped body and legs.

Color.—Entire dorsal surface varying from olivaceous brown through deep myrtle-green to pale yellowish grass-green; ventral surface white, irregularly tinged with yellow, especially on chin and throat; colors of back and belly fading rather abruptly into each other on lower part of sides; skin of under surface of limbs unpigmented, transparent; legs and jaws slightly paler on sides than above; eye very bright and iridescent, the pupil black, the iris golden greenish yellow, thickly dotted with black; back with a few—usually less than half a dozen—inconspicuous, minute, yellowish dots.

Measurements.—Type:* head and body, 48; hind leg, 69; femur, 20; tibia, 21; tarsus, 11; hind foot, 17; humerus, 8; forearm, 8; front foot, 10; greatest width of head, 14; eye to nostril, 3.5; distance between nostrils, 3.5. An adult ♂ from the type locality: head and body, 50; hind leg, 70; femur, 21; tibia, 21; tarsus, 11; hind foot, 17; humerus, 8; forearm, 8; front foot, 10; greatest width of head, 14; eye to nostril, 4; distance between nostrils, 3.

Remarks.—*Hyla evittata* is at once distinguishable from *H. cinerea*, its only near ally, by the absence of the stripes on sides and legs, so conspicuous in the latter. Except for the differences in the shape of the head, the two animals agree perfectly in form and dimensions. *Hyla evittata*, however, probably averages slightly larger than *H. cinerea*. The peculiarities in the form of the head are more readily seen than described. In *Hyla evittata* the outline of the muzzle when viewed from above is distinctly more bluntly rounded than in *H. cinerea*, and as a result the nostrils are wider apart and less distant both from eyes and tip of muzzle. Viewed from the side, the depth from nostril to mouth is perceptibly greater in *H. evittata* than in *H. cinerea*. The granulation of the skin of belly and hind legs is identical in the two animals. These comparisons are entirely based on living individuals.

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*An adult ♂ *H. cinerea* from Bay St. Louis, Miss., measures: head and body, 48; hind leg, 68; femur, 20; tibia, 21; tarsus, 11; hind foot, 15; humerus, 9; forearm, 9; front foot, 10; greatest width of head, 13; eye to nostril, 4; distance between nostrils, 2.5.

Color variation in *Hyla evittata* is very great, and as in other treefrogs chiefly dependent on the character of the surface on which the animal is resting. When searching for food among the leaves and stems of pickerel weed and pond-lilies, *Hyla evittata* assumes a yellowish grass-green tint, closely harmonizing with the color of the plants. In captivity the color is usually darker and duller, this tendency culminating in rich myrtle-green and dark olivaceous brown in individuals that have rested on brown bark or have remained long hidden in a dark corner. The color during hibernation under moss and sod is much paler than that assumed by the same individuals when hiding in similar places during the summer. However great the changes in color may be, at no time is there developed any trace of stripes. If rudiments of these are present they are always visible. Similarly in *Hyla cinerea*, which undergoes an exactly parallel series of color changes, the stripes are never affected in distinctness, though they are most conspicuous when the general color of the animal offers the greatest contrast. The stripes of *Hyla cinerea* vary in living individuals from silvery white to metallic reddish gold. The body stripes are almost invariably bordered by a narrow black line. When the animal is in repose the body stripes are about 1.5 mm. in width, but when it is uttering its note the body becomes greatly swollen and the stripes broaden to three times their normal width, and at the same time assume their brightest colors. The leg stripes are narrower and less sharply defined than the body stripes, and their dark margins are less constant in development.

As to the constancy of the color differences between the two forms: I have handled about two dozen living and freshly killed specimens of *Hyla evittata*, and have probably seen nearly as many more at a distance of only a few feet. Among these one had a faintly developed stripe at the angle of the jaw. Of the twenty-two alcoholic specimens collected by Mr. Hay and now in the National Museum, eight have traces of the body stripe, which, however, in no instance is margined with black, or as sharply defined as in those southern specimens in which the stripe is shortened and narrowed. Of sixty-one specimens of *Hyla cinerea* (seven received alive from H. H. & C. S. Brimley,* the others preserved in alcohol in the U. S. National Museum †) there is considerable variation in the leg stripes, but with only two exceptions the body stripe, though varying in length and breadth, is conspicuously developed, definite in outline, and usually margined with black. In the two abnormal individuals (one from Bay St. Louis, Miss., the other from New Orleans, La.) the leg stripes are absent, and the body stripes reduced to mere traces near the angle of the jaw. When forwarding the unstriped specimen from Mississippi, the Messrs. Brimley wrote that it was the only one of the kind observed among the large number that have passed through their hands. Such individuals as these are readily distinguishable from the faintly striped specimens of *Hyla evittata* by the form of the muzzle.

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* Taken at Bay St. Louis, Miss.

† From the following localities: Texas, New Braunfels; Louisiana, New Orleans; Florida, Clear Water, Georgiana, Indian River, Lemon City, Marco Island, Pensacola; North Carolina, Beaufort.

Habits.—Very little is known about the habits of *Hyla evittata.* In June and July the animals are to be found in the rank vegetation of the tide marshes. Here they remain quiet during the day, but as evening approaches they become active and noisy. Their food at this time consists chiefly of a small beetle that is found on the leaves of the pond-lilies. The note is like that of *Hyla pickeringii* in form, but in quality it is comparatively harsh and reedy, with a suggestion of distant Guinea-fowl chatter, and scarcely a trace of the peculiar freshness so characteristic of the song of the smaller species. The song period continues through June and July. Later in the season the frogs leave the low marsh vegetation. As they are then perfectly silent they are difficult to find, though occasionally one may be seen in a bush or small tree, but never far from water.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE DOGBANES OF THE DISTRICT OF COLUMBIA.*

BY GERRIT S. MILLER, JR.

Two dogbanes, *Apocynum cannabinum* and *A. androsæmifolium*, were recorded in the first detailed list of plants of the District of Columbia, published nearly seventy years ago.† In 1876 the same plants were included in the 'Flora Columbiana' of the Potomac-Side Naturalists' Club, without special comment.‡ Five years later Ward relegated the second species to the list of plants whose occurrence in the vicinity of Washington is doubtful.§ At the same time|| he recognized two forms of *Apocynum cannabinum*, the typical *A. cannabinum cannabinum*, of general distribution, and *A. cannabinum glaberrimum*, found only on the flats of the Potomac River bottom at Little Falls. In 1886 Knowlton discovered a species which he recorded as *Apocynum androsæmifolium*,¶ and in 1892** and 1896†† Holm published further records of a plant that he supposed to be the same. In 1897 Greene raised the *Apocynum cannabinum glaberrimum* of Ward to specific rank under the name *A. album*, and at the same time described Holm's *A.*

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† Floræ Columbianæ Prodromus, p. 24, 1830.

‡ Flora Columbiana, p. 16, 1876.

§ Guide to the Flora of Washington and Vicinity (Bull. U. S. Nat. Mus. No. 22), p. 12, 1881.

|| Ibid., p. 97.

¶ Proc. Biol. Soc., Washington, III, p. 108.

** Ibid., VII, p. 118.

†† Ibid., X, p. 36.

androsæmifolium as a new species, *A. medium.*[*] Thus *Apocynum androsæmifolium* was again eliminated from the District flora, unless Knowlton's plant should prove to have been correctly identified. His specimens, however, cannot now be found. Up to the present time, therefore, three species have been positively recorded from the vicinity of the District of Columbia:[†] *Apocynum cannabinum* Linnæus, *A. album* Greene, and *A. medium* Greene. But this number must be more than doubled, as I find from an examination of about two thousand plants that *Apocynum androsæmifolium* is actually a member of the flora, while in addition there occur three hitherto undescribed species.

NOMENCLATURE.

Eight names have been based on dogbanes from eastern North America. They are as follows:

Album. *Apocynum album* Greene, Pittonia, III, p. 230, December, **1897**, is based on the narrow-leaved, white-flowered plant of the *cannabinum* type common on the shores of the Potomac River near Washington, and throughout its range confined to similar situations. Dr. Greene informs me that the type was collected near Chain Bridge, Montgomery County, Maryland.

Androsæmifolium. [*Apocynum*] *androsæmifolium* Linnæus, Species Plantarum, p. 213, **1753**, is the spreading, large-flowered dogbane of the Boreal and Transition zones. Eastern Canada is probably the type locality of the species.

Cannabinum. [*Apocynum*] *cannabinum* Linnæus, Species Plantarum, p. 213, **1753**, is an erect, green-flowered plant of eastern North America. The original description leaves no doubt that the name was used by Linnæus in essentially the same sense that it is understood today.

Glaberrimum. [*Apocynum cannabinum*] *a glaberrimum* De Candolle, Prodr. Syst. Nat. Regn. Veg., pt. VIII, p. 439, **1844**. The description of this plant (under *Apocynum cannabinum*) is as follows: "*a glaberrimum.* A. Canadense maximum flore minimo herbaceo. Pluk. 35, t. 13 f. 1. (ic. mediocr.) *A. erectum*, etc., ejusd. t. 260. f. 4. A. cannabinum R. Br. wern. trans. I. p. 68. Torr.! fl. un. st. p. 276. A. cannabinum *a* Hook. l. c. t. 139 opt. A. piscatorium Dougl.! mss. ex nostr. specim. hic referendum; eamdem vero plantam ad A. hypericifolium retulit cl. Hook. l. c. (v. s.)" This name has recently been used by Britton and Brown for the plant described as *A. album* by Greene. The reason for this course is not clear, as none of the descriptions cited by De Candolle refer to the plant in question. Plukenet's figures, for a tracing of which I am indebted to Mr. Chas. Bullard, of Cambridge, Mass., both represent broad-leaved plants of the *cannabinum* type. R. Brown's description * refers merely to a lanceolate-leaved, glabrous plant. It contains no reference to any of the peculiar characters of *Apocynum album*. The same is true of the accounts given by Torrey and Hooker. It seems obvious, therefore, that unless better evidence can be brought forward than that furnished by the original description, the name *glaberrimum* is too vaguely defined to supplant the well-established name *album*. At most it can perhaps be used for one of the numerous forms of *Apocynum cannabinum*.

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[*] Pittonia, III, pp. 229–230, December, 1897.

[†] That is, within a radius of twenty miles from the Capitol.

Hypericifolium. *Apocynum hypericifolium* Aiton, Hortus Kewensis, I, p. 304, **1798**, is a clasping-leaved green-flowered plant that has not yet been detected in the neighborhood of the District of Columbia. Although recorded from Virginia † the species is now known from the region west of the Alleghenies only.

Incanum. [*Apocynum androsæmifolium*] *β. incanum* De Candolle, Prodr. Syst. Nat. Regn. Veg., pt. VIII, p. 439, **1844**, is merely an unusually pubescent individual of *Apocynum androsæmifolium*. Such plants not infrequently occur, but they do not represent a definite form.

Medium. *Apocynum medium* Greene, Pittonia, III, p. 229, December, **1897**, is a small-flowered member of the *androsæmifolium* group. It was first recorded by Holm as *Apocynum androsæmifolium*.

Pubescens. *A*[*pocynum*] *pubescens* R. Brown, Mem. Wern. Nat. Hist. Soc., I, (1808–10), p. 68, **1811**,‡ from Virginia, is a pubescent form of *A. cannabinum*, probably worthy of recognition by name. A plant agreeing closely with the original description is not uncommon in the District of Columbia; and the U. S. National Herbarium contains a specimen collected in Virginia. This is a whitish-flowered species probably distinct from the *A. pubescens* of Britton and Brown.§

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* "*A. cannabinum*, foliis lanceolatis utrinque acutis, glabris, cymis paniculatis, calyce tubum corollæ aequante." This copy I owe to Mr. Chas. Bullard.

† De Candolle, Prodr. Syst. Nat. Regn. Veg., pt. VIII, p. 440, 1844.

‡ Professor N. L. Britton has kindly sent me a copy of the original description of *Apocynum pubescens*. It is as follows: "*A. pubescens*, foliis ovato-oblongis mucronatis; basi obtusis; utrinque cymaque breviore pubescentibus, calyce corollam subæquante.

"Hab. In Virginia, Mitchell, in Herb. Banks, [ubi V. S.]."

§ Ill. Flora N. United States, Canada, and Brit. Poss., III, p. 3. 1898.

SYNOPSIS OF THE DOGBANES OF THE DISTRICT OF COLUMBIA.

Corolla conspicuous (white or pink), its lobes spreading or recurved.
  Inflorescence both terminal and axillary; corolla terete, broadly campanulate, bright pink, about 8 mm. in length, its tube narrowed in the throat at level of tips of calyx lobes.......................A. ANDROSÆMIFOLIUM (p. 82).
  Inflorescence strictly terminal; corolla pentagonal, urceolate to campanulate or tubular, white or pale pink, 4–7 mm. in length, its tube not narrowed in the throat.
    Branches mostly green, ascending; erect white flowers (about 7 mm. long) in large, compact, rather flat cymes; corolla campanulate.........A. SPECIOSUM (p. 83).
    Branches mostly strongly tinged with reddish purple, those at least of the upper part of the plant widely spreading; suberect white or pale pink flowers (4–6 mm. long) in small, loose, irregular cymes; corolla tubular to urceolate.
      Calyx lobes broad, much shorter than tube of pinkish, suburceolate or tubular corolla; flowers about 6 mm. in length........A. MEDIUM (p. 84).
      Calyx lobes narrow, about as long as tube of white, urceolate corolla; flowers about 5 mm. in length...................A. URCEOLIFER (p. 85).
Corolla inconspicuous (greenish or whitish), its lobes erect or nearly so.
  Leaves few, spreading or drooping on slender petioles which are usually three times the length of the flowers...................................A. NEMORALE (p. 87).
  Leaves many, ascending on robust petioles which are usually scarcely longer than flowers.
    Leaves glabrous, from one-fifth to one-fourth as broad as long; flowers essentially white; plant very slender and much branched............A. ALBUM (p. 88).
    Leaves pubescent on underside at least, from one-third to one-half as broad as long; flowers varying from dull green to white; plant stout and relatively less branched.................A. CANNABINUM (page 86).

Apocynum androsæmifolium Linnæus.

(Pl. II, Fig. 1.)

1753. [*Apocynum*] *androsæmifolium* Linnæus, Species Plantarum, p. 213.
1844. [*Apocynum androsæmifolium*] *β. incanum* De Candolle, Prodr. Syst. Nat. Veg., pt. VIII, p. 439.
1898. *Apocynum androsæmifolium* Britton and Brown, Illustrated Flora Northern United States, Canada, and Brit. Poss., III, p. 3.

Type locality.—Probably eastern Canada.

Geographic distribution.—Eastern North America from Newfoundland (specimen in U. S. Nat. Herb.) to Georgia (Britton and Brown), west to the plains.

Zonal position.—*Apocynum androsæmifolium* appears to be an inhabitant of the Transition zone and Lower Boreal zone, occasionally reaching the Upper Austral zone, but probably by accident.

Habitat.—Thickets and fields.

Characters.—*Plant* robust, 1 to 1.5 m. high, from a perennial horizontal rootstock; *branches* dichotomously widely spreading, glabrous, strongly tinged with purple; *leaves* spreading, mucronate tipped (about 55 x 40 mm.), the uppermost ovate oblong, the lower broadly rounded at base, the upper slightly narrowed; upperside of leaves glabrous, dusky green, underside of leaves pale, and finely but inconspicuously pubescent; *petioles* slender, mostly about 5 mm. in length, finely pubescent on underside; *inflorescence* in small, irregular, terminal and axillary cymes of few nodding flowers, the axillary clusters generally the smaller; cymes usually shorter than leaves; *pedicels* 5–10 mm. in length, subulate-bracted at base; *calyx* glabrous, its segments narrow, generally less than half as long as corolla tube; *corolla* bright pink, in fully developed flowers about 8 mm. long, widely campanulate, its tube terete, the throat narrowed at level of tip of calyx lobes; corolla segments rounded at tip, considerably more than half as long as tube, and when fully developed conspicuously recurved; *pods* drooping, about 170 mm. in length.

Remarks.—*Apocynum androsæmifolium* is immediately recognizable among the species occurring in eastern North America by its ovate leaves, and large, bright pink, nodding flowers in partly axillary clusters, and by the terete corolla tube, distinctly narrowed in the throat. The outline of the corolla varies much in different stages of growth. Some of the forms that it assumes in its development from the bud to the fully grown flower are shown in the figures (see Pl. II, Fig. 1). Throughout its growth, however, the corolla tube is strictly terete, while in all of the plants with which the species might be confused the pentagonal contour of the corolla is evident even in the half-grown buds. The characteristic form of the corolla is for the most part lost in dried specimens. On account of the dichotomous branching of the stem, there can be no distinct central flower cluster as in *A. cannabinum*.

The only specimens of this species positively known to have been collected in the vicinity of the District of Columbia are two plants which I found at the roadside between Sligo Branch and Paint Branch, Montgomery County, Maryland, on June 25, 1899.

Apocynum speciosum sp. nov.

(Pl. II, Fig. 2.)

Type No. 340,395, United States National Herbarium, collected in dry old field, at side of road leading from Silver Spring to Sligo Branch, Montgomery County, Maryland, June 25, 1899, by Gerrit S. Miller, Jr.

Geographic distribution.—*Apocynum speciosum* is at present known from two localities, Sligo and Glen Echo, both in Montgomery County, Maryland.

Zonal position.—From its manner of occurrence this species appears to be a member of the Upper Austral flora.

Habitat.—Fields and roadsides.

Characters.—*Plant* robust, .75 to 1.25 m. high, from a perennial horizontal rootstock, *branches* ascending, glabrous, green; *leaves* ascending, oblong, inconspicuously mucronate tipped, the lower (mostly about 70–80 x 35–45) slightly rounded at base, the uppermost tapering at each end; upperside of leaves dark green, glabrous, underside slightly paler and essentially glabrous except along the veins where a fine pubescence may be detected; *petioles* 4–8 mm. in length, slender above, shorter and more robust below, finely pubescent on underside; *inflorescence* in large compact, flat-topped strictly terminal cymes of very many erect flowers, the cymes at first exceeded in length by the leaves, but afterwards slightly longer; *pedicels* about 4 mm. in length subulate-bracted at base; *calyx* very slightly pubescent (this character probably variable), its segments narrow, half as long as corolla tube; *corolla* white or very faintly tinged with pink inside, about 6–7 mm. in length, campanulate, its tube distinctly pentagonal, the throat not narrowed; corolla segments pointed, slightly more than half as long as tube, spreading but not recurved; *pods* drooping, about 70 to 120 mm. in length.

Remarks.—In this plant the habit is almost precisely similar to that of *A. cannabinum*. The branches are erect, very indistinctly, if at all, dichotomous, the leaves ascending, the flowers upright, and the inflorescence is in distinctly flat-topped cymes, the central of which, at the end of the main stem, is usually but not always the largest, and earliest to flower. As the lateral branches rise toward or above the level of the central head they in turn produce flat, terminal clusters, thus prolonging the flowering season from before the middle of June nearly to the middle of August. Accompanying the luxuriant inflorescence of this plant is an unusually profuse development of fruit, which often hangs in dense clusters from the lower part of a cyme which above is still a mass of flowers.

Apocynum medium Greene.

(Pl. II, Fig. 3.)

1892. *Apocynum androsæmifolium* Holm, Proc. Biol. Soc. Washington, VII, p. 118 (not of Linnæus 1753).
1897. *Apocynum medium* Greene, Pittonia, III, p. 229, December, 1897.

Type locality.—Vacant lots bordering 12th St., in Brookland, D. C.

Zonal position.—*Apocynum medium* will probably be found to occur throughout the upper Austral zone of the eastern United States. It is to be looked for also in the lower part of the Transition zone.

Habitat.—Dry, open ground.

Characters.—*Plant* slender, seldom more than 1 m. high, from a perennial horizontal rootstock; *branches* dichotomously widely spreading, glabrous, reddish purple; *leaves* spreading, oblong, mucronate-tipped, the lowermost (about 85 x 40) somewhat rounded at base, the uppermost tapering at each end; upperside of leaves dark, clear green, glabrous; underside yellowish green, finely pubescent; petioles about 5 mm. in length, slender above, more robust below, finely pubescent; *inflorescence* in small rather compact, strictly terminal but not flat topped, cymes of numerous suberect flowers, the cymes usually exceeded by the leaves; *pedicels* 2–3 mm. in length, subulate bracted at base; *calyx* finely pubescent (this character probably inconstant), its segments broad, distinctly less than half as long as corolla tube; *corolla* light pink, or white strongly blotched with pink inside, about 5–6 mm. in length, suburceolate or tubular, its tube distinctly pentagonal, the throat not narrowed, corolla segments rounded, half as long as tube, spreading but not recurved; *pods* drooping, about 90 mm. in length.

Remarks.—Apocynum medium has essentially the habit of *A. androsæmifolium* though its peculiarities are slightly less pronounced. Together with *A. urceolifer* it is readily distinguished from *A. androsæmifolium* by its differently shaped leaves, much smaller suberect flowers in strictly terminal racemes, and by the distinctly pentagonal corolla tube. The form of the corolla tube varies in perfectly developed flowers from faintly suburceolate to essentially short tubular, though the first is the more usual. The calyx segments are very short, conspicuously less than half as long as corolla tube. In drying, the corolla shrinks more than the calyx, so that in herbarium specimens the latter appears relatively longer than it actually is. I have examined one hundred or more living plants of this species growing in vacant lots on 12th St., Brookland, D. C., where Dr. Greene informs me his original specimens were collected.

Apocynum urceolifer sp. nov.

(Pl. II, Fig. 4.)

Type No. 340,396, United States National Herbarium, collected on open, dry hillside at Capitol View Park, Montgomery County, Maryland, July 2, 1899, by Gerrit S. Miller, Jr.

Geographic distribution.—This species has been collected at the type locality and at Brightwood, D. C.

Zonal position.—Apocynum urceolifer is probably a member of the Upper Austral flora.

Habitat.—Fields and roadsides.

Characters.—Plant slender, usually less than 1 m. high, from a perennial horizontal rootstock; *branches* dichotomously widely spreading, glabrous, strongly tinged with reddish purple; *leaves* spreading, oblong, mucronate tipped, the lowermost (about 90 x 40) rounded or subcordate at base, the uppermost tapering at each end, but more abruptly at base; upperside of leaves, clear green, glabrous; underside yellowish green, finely pubescent; petioles 2–4 mm. in length, finely pubescent on lower side; *inflorescence* in small, rather compact, but not flat-topped, strictly terminal cymes of numerous suberect flowers, the cymes at first exceeded by the leaves, finally slightly longer; pedicels 3–5 mm. in length, subulate-bracted at base; calyx glabrous or pubescent, its segments very narrow, generally as long as corolla tube; *corolla* white or just perceptibly tinged with pink; about 4–5 mm. in length, urceolate, its tube conspicuously pentagonal, the throat not narrowed, corolla segments pointed, slightly more than half as long as tube, spreading but not recurved; *pods* drooping, about 90 mm. in length.

Remarks.—Although at first sight *Apocynum urceolifer* rather closely resembles *A. medium*, the two plants are readily distinguishable. In habit they are essentially the same, but *A. urceolifer* is smaller and its stems are usually less strongly tinged with reddish purple, though in all probability neither character is constant. Its flowers are smaller than those of *A. medium*, and generally pure white, though sometimes faintly tinged with pink. The corolla is more conspicuously pentagonal, and very noticeably contracted at base of segments. The corolla segments are relatively longer and narrower than in *A. medium*, and distinctly pointed instead of rounded or obscurely pointed at tips. The calyx lobes are generally as long as the corolla tube, and frequently longer, sometimes a little spreading at tips, while in *A. medium* they are less than half as long as corolla tube and always closely appressed.

I have seen this plant growing at the type locality only. It is there common on the southeast slope of the hill directly north of the quarry. Mr. W. R. Maxon has collected it at the side of the Military Road, between Brightwood, D. C., and Rock Creek.

Apocynum cannabinum Linnæus.

(Pl. II, Figs. 6–7.)

1753. [*Apocynum*] *cannabinum* Linnæus, Sp. Plant., p. 213.
1811. *A*[*pocynum*] *pubescens* R. Brown, Mem. Wern. Nat. Hist. Soc., I, p. 68 (Virginia).
1844. [*Apocynum cannabinum*] *a glaberrimum* De Candolle, Prodr. Syst. Nat. Reg. Veg., pt. VIII, p. 434 (eastern North America).
1881. *Apocynum cannabinum* Ward, Guide to Flora of Washington and Vicinity (Bull. 22, U. S. Nat. Mus.), p. 97.
1898. *Apocynum cannabinum* Britton and Brown, Ill. Flora N. United States, Canada, and Brit. Poss., III, p. 3.

Type locality.—Probably eastern Canada.

Geographic distribution.—Eastern United States and southeastern Canada. Western limits of range not known.

Zonal position.—Transition and Austral zones.

Habitat.—Fields, thickets, and open woods.

Characters.—*Plant* robust, 1 to 1.75 m. high, from a perennial, horizontal, widely spreading rootstock; *branches* ascending, glabrous to densely velvety pubescent, green to reddish purple; *leaves* ascending, mucronate tipped, usually oblong and slightly more rounded at base than at tip, but often, especially the uppermost, tapering equally at each end, and lowermost frequently slightly cordate; dimensions when full grown about 120 x 55; upperside of leaves green, varying much in shade, generally glabrous but occasionally velvety pubescent; underside paler and usually tinged with yellow, often densely pubescent, and seldom if ever without trace of pubescence, at least on the veins; *petioles* 3–7 mm. in length, slender above, shorter and robust below, pubescent or glabrous on underside; *inflorescence* in strictly terminal cymes, the larger of which are distinctly flat topped, the central cyme always developing first, and generally the largest; cymes composed of very many erect flowers and generally exceeded by the leaves; *pedicels* 1–4 mm. in length, subulate-bracted at base, glabrous or pubescent; *calyx* glabrous or pubescent, its segments very variable in form, but usually about equal to corolla tube in length, or slightly shorter, the tips appressed or widely spreading; *corolla* varying in color from white to dull green, and in length from 3 mm. to 4.5 mm., generally glabrous, but often pubescent, pentagonal, tubular or slightly campanulate; corolla segments equal to or shorter than tube, rounded or bluntly pointed at tips, erect or very slightly spreading, the margins usually slightly revolute; pods drooping, 130–200 mm. in length.

Remarks.—Apocynum cannabinum is a highly polymorphic species, much in need of critical study. It is readily distinguished, among the species known to occur in the eastern United States, by its robust, upright habit, large, short-petioled leaves, and small, green, greenish, whitish, or white flowers, with erect corolla lobes. Within these limits, however, variation is so great as to suggest the existence of numerous partly or perhaps completely segregated forms. Of those that occur in the District of Columbia, the most strongly marked is the *A. pubescens* of R. Brown. The whole plant (or the upper part at least) is densely velvety pubescent, and the upper leaves are unusually short, broad, and closely set. Flowers greenish or white. This is probably not the *A. pubescens* of Britton and Brown. Glabrate and narrow-leaved forms occur, and others of unusually slender habit; but I have seen none that bridge the gap between *A. cannabinum* and either of the following species.

Apocynum nemorale sp. nov.

Type No. 340,397, United States National Herbarium, collected at roadside in woods near end of Chain Bridge, Fairfax County, Virginia, July 14, 1899, by Wm. Palmer.

Geographic distribution.—This species is now known only from the type locality and the Virginia shore of the Potomac River at Great Falls.

Zonal position.—Probably confined to the Upper Austral and Transition zones.

Habitat.—Open woods.

Characters.—Like *Apocynum cannabinum* Linnæus, but with relatively few, spreading or drooping, leaves on slender petioles (usually 10–15 mm. in length) two or three times as long as flowers; corolla glabrous, greenish.

Remarks.—I should hesitate to separate this plant from *Apocynum cannabinum* were not its characters, trivial though they appear on paper, striking and constant in specimens, especially those living or freshly collected. Furthermore, while *A. cannabinum* occasionally occurs in open woods, together with *A. nemorale*, it never, so far as known, shows any tendency to assume the characters of the latter.

Apocynum album Greene.

(Pl. II, Fig. 5.)

1881. *Apocynum cannabinum* var. *glaberrimum* Ward, Guide to Flora of Washington and Vicinity (Bull. 22, U. S. Nat. Mus.), p. 97 (not of De Candolle, 1844).
1897. *Apocynum album.* Greene, Pittonia, III, p. 230. December, 1897.
1898. *Apocynum cannabinum glaberrimum* Britton and Brown, Ill. Flora, N. United States, Canada and Brit. Poss., III, p. 3 (not of De Candolle, 1844).

Type locality.—Shore of Potomac River, near Chain Bridge, Montgomery County, Maryland.

Geographic distribution.—The range of *Apocynum album* is not well understood. Britton and Brown say, "range apparently nearly of the type, but more abundant northward." I have examined specimens from various points in Maryland along the shores of the Potomac River from Old Town to Marshall Hall, also from mouth of Tucquan Creek, Lancaster County, Pennsylvania; Stratford, Connecticut; and Ithaca, New York.

Zonal position.—Probably confined to the Upper Austral and Transition zones.

Habitat.—Beaches and river shores.

Characters.—Like *Apocynum cannabinum* Linnæus, but of more slender, branching habit, and with smaller, much narrower leaves and essentially white flowers. The largest leaves are about 110 mm. in length by 20–30 mm. in breadth, those of the upper part of the plant much smaller (about 60 x 15). They are oblong-lanceolate in form, those of the upper part of the plant acute at each end, those of lower part of plant rounded at base. All are mucronate tipped and wholly glabrous throughout. Petioles 2–3 mm. in length. Stems green, very slightly purple tinged, slender and much branched, the branching more profuse than in *A. cannabinum*, but of the same character. Inflorescence in terminal irregular cymes never as large as those commonly met with in *A. cannabinum.* Calyx lobes about as long as corolla tube or slightly shorter. Corolla about 4 mm. in length, white, often faintly tinged with green, pentagonal, short tubular or faintly campanulate, the upright lobes slightly more than half as long as tube, rounded at tips. Pods about 125 mm. in length. Rootstock horizontal, perennial, widely branching.

Remarks.—Apocynum album is so different from *A. cannabinum* as to require no very close comparison. The peculiar character of its habit, leaves, and inflorescence sharply differentiate it. The white or nearly white flowers, however, are not, taken alone, diagnostic, as forms of *A. cannabinum* frequently occur in which the corolla is equally white.

This plant appears to be strictly confined to beaches and river 'bottoms.' Near Washington it occupies, to the exclusion of other members of the genus, the flats and islands of the Potomac, seldom if ever growing on land that is not flooded at high water. Mr. E. A. Preble has sent me specimens from a small island in the Potomac at Oldtown, Maryland, and Mr. Wm. Palmer has collected it at Marshall Hall.

EXPLANATION OF PLATE II.

(All figures three times natural size.)

Fig. 1. *Apocynum androsæmifolium* Linnæus, from Maryland.

Fig. 2. *Apocynum speciosum* Miller, topotype.

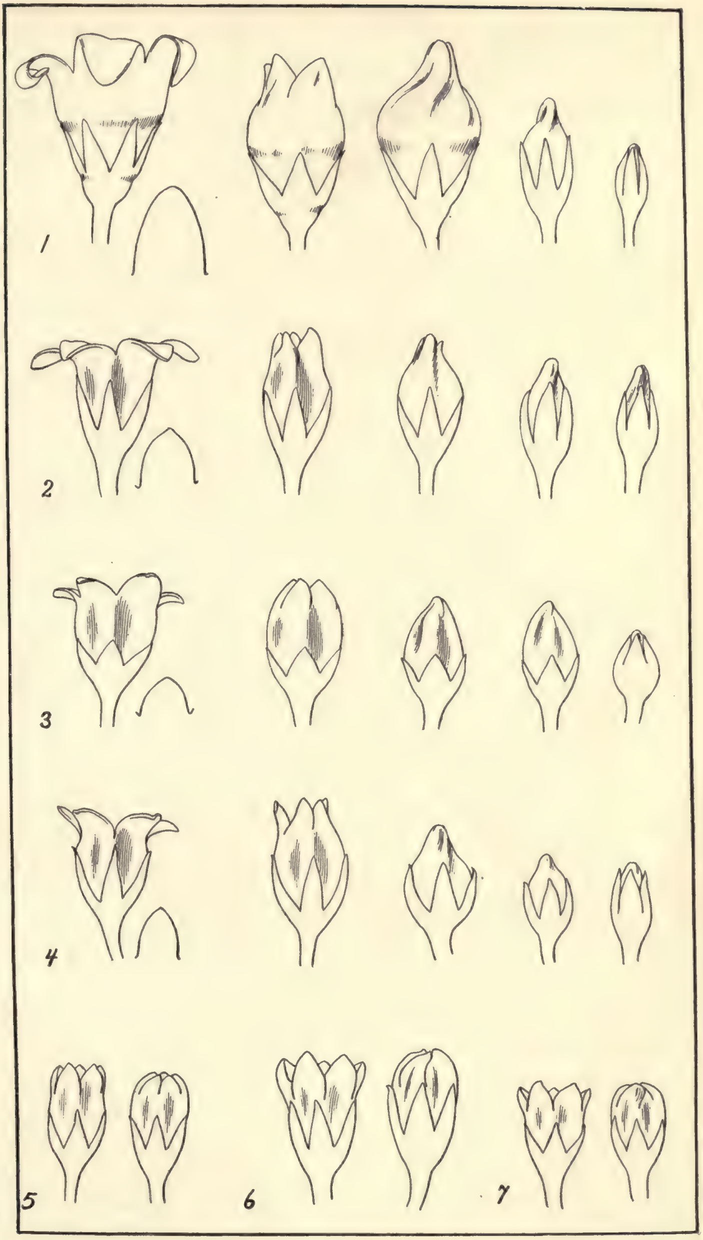
Fig. 3. *Apocynum medium* Greene, topotype.

Fig. 4. *Apocynum urceolifer* Miller, topotype.

Fig. 5. *Apocynum album* Greene, topotype.

Fig. 6. *Apocynum cannabinum* Linnæus, large-flowered form, from Kensington, Maryland.

Fig. 7. *Apocynum cannabinum* Linnæus, small flowered form, from Capitol View Park, Maryland.



DOGBANES OF THE DISTRICT OF COLUMBIA

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ON SOME NEW OR RARE BIRDS FROM THE SIERRA NEVADA DE SANTA MARTA, COLOMBIA.

BY OUTRAM BANGS.

From the latter part of January until early April, 1899, Mr. Wilmot W. Brown, Jr., collected, nearly continuously, in the Sierra Nevada de Santa Marta, Colombia, visiting many different stations at altitudes ranging from 3,000 to 15,000 feet. During this period he obtained more than 1,300 birds. The collection contains many species which he had not previously taken, some of which are new, besides series of many of the rarer species previously known only from a few specimens.

At a future date I intend, with Mr. Brown's help, to give a complete list, with field-notes, of all the birds he has collected in these mountains. In the present paper, the fourth on the birds of this region,* I merely describe the new forms, record additional specimens of a few of the rarer species, and give those not previously taken by Mr. Brown.

Three gentlemen who have been extremely kind to Mr. Brown while in Colombia, and to whom I wish to express my thanks for the aid they have rendered him, are Theodoro V. Henriquez, U. S. consul at Rio Hacha; Pedro Christoffel, Indian inspector of the Sierra Nevada, and M. Carr, H. M. consul at Santa Marta. Again, I am under great obligations to Mr. Robert Ridgway and Dr. Chas. W. Richmond for allowing the use of the collection of birds in the National Museum, and in giving me valuable assistance in determining many species. I am also greatly indebted to my friend, Mr. Chas. F. Batchelder, for his kindness in allowing me to examine the Lafresnaye types in the collection of the Boston Society of Natural History, of which he is curator.

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*See Proc. Biol. Soc. Wash., XII, pp. 131-144, 157-160, 171-182, 1898.

(NOTE.—All measurements are in millimeters. Colors, when definite names are used, follow Ridgway's 'Nomenclature of Colors.')

Actitis macularia (Linn.).

One adult female, La Concepcion, Mar. 23, 1899.

Aramides axillaris Lawr.

One adult male, Chirua, Mar. 13, 1899.

Gypagus papa (Linn.).

Three adults—a male from El Paramo de Macotama, 11,000 feet; one from Chirua; and a female from La Concepcion.

Falco rufigularis Daud.

One adult male, from La Concepcion, Mar. 31, 1899.

Amazona mercenaria (Tsch.).

Two males, from Paramo de Chiruqua, 11,000 feet.

Aulacorhamphus lautus Bangs.

Four adults, both sexes, from Chirua and La Concepcion. All agree closely with the type from San Miguel.

Pharomachrus festatus* sp. nov.

Three specimens from Chirua, one adult male, two adult females.

Type, from Chirua, Colombia; altitude, 7,000 feet. No. 6235, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 20, 1899, by W. W. Brown, Jr.

Specific characters.—Intermediate in size, between *P. antisianus* and *P. auriceps;* bill intermediate in size, between the bills of these two species; adult ♂, with the three outermost rectrices white at ends (both outer and inner webs white, quills black), rest of tail black; adult ♀, with the three outermost rectrices white at ends, crossed lower down by black bars.

Color.—Adult ♂: Head, back, rump, breast, upper tail-coverts, and wing-coverts metallic green, in some lights bronzy, this tone more noticeable on head, throat, and upper tail-coverts; abdomen and under tail-coverts scarlet vermilion; primaries, secondaries, tertials and greater coverts black; flanks and sides black, the black feathers mostly concealed; tail black, the three outermost rectrices with grayish white ends, the quills black to their ends; white end on outer rectrix 50 mm. long, on next rectrix 59 mm. long, and on third 32 mm. long; 'bill yellow; iris hazel;'† feet brownish black.

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* Festatus, dressed in festal attire.

† Noted by Mr. Brown from fresh specimen.

Adult ♀, less brilliant than the ♂; throat and breast much mixed with drab brown; outer edges of primaries yellowish brown; tail black, the three outermost rectrices with deep white tips, the lower part of white tip crossed by two or three black bars; outermost rectrix with three white spots on outer web below lower cross-bar; second rectrix with one white spot on outer web below lower cross-bar; 'iris brown;'* bill yellowish brown.

Measurements.—Type, adult ♂: Wing, 190; tail, 157; tarsus, 20; exposed culmen, 19.

Topotypes, adult ♀, No. 6236: Wing, 188; tail, 158.4; tarsus, 20; exposed culmen, 18.4.

Adult ♀, No. 6237: Wing, 189; tail, 158; tarsus, 19.6; exposed culmen, 18.4.

In the adult ♂ the longest upper tail-covert projects 48 mm. beyond the tail.

Remarks.—Had Mr. Brown taken but one specimen of this fine trogon I should have been inclined to regard it as a hybrid between *P. antisianus* and *P. auriceps.* Three examples, however, each one showing the characters equally well, disprove any such idea.

The type is a *fully adult* male, there is no trace of brownish on the outer edges of the primaries, the bill is wholly yellow, and the breast wholly metallic.

The difference in size and the peculiar tail, unlike that of either of the related species, distinguish this new trogon, which is probably confined to the Sierra Nevada de Santa Marta.

Trogon personatus Gould.

Eight specimens, both sexes, from Chirua, La Concepcion, and Macotama.

Chloronerpes yucatanensis uropygialis (Cab.).

Four specimens, both sexes, from La Concepcion and San Miguel. All agree exactly with Cabanis' description and with specimens in the U. S. National Museum from Costa Rica. This form, which ranges from Costa Rica southward, is distinguished from the more northern *C. yucatanensis* by the golden-brown back, the back of true *C. yucatanensis* being green.

Pygmornis striigularis Gould.

Two males from La Concepcion, altitude 3,000 feet.

Leucuria phalerata Bangs.

One adult male from Paramo de Macotama, 11,000 feet, Mar. 11, 1899. This specimen, in fine plumage, is just like the type, except that the bill is a little longer.

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* Noted by Mr. Brown from fresh specimen.

Lafresnaya gayi Bourc. and Muls.

Four specimens, three males and one female, from Macotama, San Miguel, and Paramo de Chiruqua.

Rhamphomicron dorsale Salv. and Godm.

Four specimens. An adult female and two adult males were taken at Paramo de Chiruqua, at the edge of the snow, on Mar. 25 and Feb. 25, 1899, at an altitude of 15,000 feet. A young male taken at La Concepcion, Feb. 16, 1899, at 3,000 feet, is much like the adult female, having a green back and spotted underparts; its tail, however, is like that of the adult male, except that the ends of the feathers are decidedly tipped with white.

Anthocephala floriceps (Gould).

Nine specimens, from Pueblo Viejo (8,000 feet), Santa Cruz, La Concepcion, San Francisco, and Chirua. Four are adult males, two adult females, and three young males. The female has already been described by Messrs. Salvin and Godman. It differs from the male in lacking the crown patch, the top of the head being dull coppery green, much like the color of the rump. The tail is colored alike in both sexes; that of the female, however, has the central rectrices narrower. The whole tail is a little shorter and smaller than in the adult male. The young male is similar to the adult female.

Mr. Brown was especially on the lookout for the local species of hummers, none of which, except *Metallura districta* (described below) and *Panychlora russata*, seem to be easy to get. Before he started on his second trip he carefully studied the plates and descriptions of *Oxypogon cyanalæmus* and *Campylopterus phainopeplus*, so as to know the birds at once, but during nearly three months of active collecting he never saw a living example of either species.

Metallura districta* sp. nov.

Sixteen specimens from Pueblo Viejo (8,000 feet), La Concepcion, San Miguel, Paramo de Macotama, Macotama and Paramo de Chiruqua.

Type, from San Miguel, Colombia; altitude, 7,500 feet. No. 6223, ♀ adult, coll. of E. A. and O. Bangs. Collected Feb. 6, 1899, by W. W. Brown, Jr.

Specific characters.—Adult ♂ with much the general appearance of *M. smaragdinicollis*, except that the rectrices are wider; the color of the tail is more auricular purple, less truly violet; under tail-coverts *buffy;* adult ♀ differing from ♀ of *M. smaragdinicollis* in being paler on throat and breast, and of a more uniform color, and in being very much less spotted with green below.

Color.—Adult ♂: Upper surface dark, shining grass green; wings dark purplish brown; bend of wing rufous; under surface shining grass green, somewhat varied by dusky, whitish, and buff edges and bases of some of the feathers, the buff showing most on breast and the dusky and whitish on center of abdomen; luminous throat patch glittering grass green; partially concealed woolly feathers on center of belly and flanks white; under tail-coverts ochraceous-buff with faint green central spots; tail, below, shining auricular purple; above, in some lights, auricular purple, in others, dark shining grass green. Adult ♀, above shining grass green; below, throat ochraceous-rufous, gradually becoming ochraceous-buff on chest and center of abdomen; sides spotted with shining grass green; under tail-coverts ochraceous-buff with dusky central spots; tail smaller than in the ♂, all the outer rectrices tipped with buff. Young ♂ similar to adult ♀, but with rather more green on sides; older ♂ similar to adult ♂, but lacking the luminous throat patch.

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* Districtus, busy, occupied.

Measurements.—Adult ♂, No. 6232, from Paramo de Macotama: Wing, 60; tail, 44; culmen, 12.6; width of central rectrix, 10.8. Adult ♀ (type): Wing, 53; tail, 34.4; culmen, 12.4; width of central rectrix, 8.2.

Remarks.—Strangely enough *M. districta* bears a much stronger superficial resemblance to the far-away *M. smaragdinicollis*, as pointed out by Messrs. Salvin and Godman and by myself, than it does to its nearest neighbor, *M. tyrianthina*, of Venezuela and Colombia. The splendid series secured last winter by Mr. Brown proves, as might be expected, that the slight differences between the Sierra Nevada de Santa Marta bird and *M. smaragdinicollis* are perfectly constant.

Ochthodiæta pernix * sp. nov.

Type, and only specimen, from Macotama, Colombia; altitude, 9,000 feet. No. 6004, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 4, 1899, by W. W. Brown, Jr.

Specific characters.—Not like any other species in the genus.

Color.—Upper parts bister, slightly darker on head and upper tail-coverts; wings dusky, wing-coverts and secondaries edged with ferruginous,† inner webs of secondaries ferruginous, except the dusky tip, lower half of inner webs of primaries ferruginous; tail dusky, outer web of outer rectrix ferruginous; throat white, streaked with olive; breast olive—each feather darkest at center, lighter at edges and often bordered with ferruginous, giving a streaked appearance; belly aud crissum ferruginous; sides ferruginous, slightly shaded with olive; a blackish spot directly in front of eye, rest of lores whitish; lining of wing ferruginous; feet and bill black.

Measurements.—Type, adult ♂: Wing, 103; tail, 83; tarsus, 25.6; exposed culmen, 21.2.

Remarks.—*O. pernix* is wholly different from either *O. fumigatus* of Colombia or *O. lugubris* of Merida. Perhaps its nearest relative is *O. fusco-*

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* Pernix, quick, active, nimble.

† The color called 'ferruginous' is not quite the ferruginous of Ridgway, but is rather duller. On the wings it inclines toward hazel and on the under parts it is a little blended with olive.

rufus of Bolivia and southern Peru. It differs much, however, from that bird in its streaked throat and breast, as well as in other details of coloring. Although smaller, in a general way *O. pernix* suggests *Myiotheretes striaticollis*, which occurs in the same region with it. The two are, of course, very different in detail, but their superficial resemblance is quite striking.

Ochthœca poliogastra Salv. and Godm.

Fourteen specimens, taken at all stations between 9,000 and 12,000 feet. On Mr. Brown's first trip he took only a single specimen of this local species.

Platyrhynchus albogularis Scl.

One female from La Concepcion, 3,000 feet, Jan. 29, 1899.

Euscarthmus granadensis Hartl.

One male from La Concepcion, Jan. 29, 1899.

Hapalocercus paulus* sp. nov.

Ten specimens from Chirua, La Concepcion and San Miguel.

Type from Chirua, Colombia; altitude, 7,000 feet. No. 6115, ♀ adult, coll. of E. A. and O. Bangs. Collected Mar. 17, 1899, by W. W. Brown, Jr.

Specific characters.—Nearest *H. fulviceps* (Scl.) of Ecuador and Peru, but rufous crown patch narrower and shorter, not reaching eye nor bill; sides of head not distinctly rufus; also differing in details of coloration.

Color.—Above dull olive; wings dark hair-brown, with paler and more drab edges; greater and middle coverts tipped with isabella color (in some specimens cinnamon) forming two wing bars; inner webs of tertials and secondaries broadly edged with buff; tail hair brown with slight isabella color edges and tip; head subcrested, vertical feathers orange-rufous basally; sides of crown and forehead like back; lores, auriculars, and orbital ring dull cinnamon, very different in color from crest; throat, breast, and center of belly whitish, with an ill-defined and indistinct darker pectoral band; sides, flanks, and under tail-coverts straw-yellow, darkest and slightly tinged with olive on lower sides; lining of wing straw-yellow. Sexes similar.

Measurements.—Type, adult ♀: Wing, 45.6; tail, 37; tarsus, 19.6; exposed culmen, 10.

Adult ♂, No. 6117, from La Concepcion: Wing, 46; tail, 39; tarsus, 19.2; exposed culmen, 10.

Remarks.—*H. paulus* needs no comparison with the other Colombian species, *H. acutipennis*, which has acuminated primaries. Its relationship lies with *H. fulviceps* of western Ecuador and Peru.

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*Paulus, small, little.

Serpophaga cinerea grisea (Lawr.).

Five specimens, from Chirua, San Miguel, and La Concepcion. These are just like skins in the U. S. National Museum from Costa Rica—true *grisea* of Lawrence—which seems to me to represent a perfectly good subspecies, differing considerably in color from true *S. cinerea* of Ecuador and Peru. Sclater, however, in the 'Catalogue of Birds in the British Museum' unites the two without a word.

Myiopatis montensis * sp. nov.

Eighteen specimens from Paramo de Macotama, 11,000 feet; Macotama, 9,000 feet, and Paramo de Chiruqua, 12,000 feet.

Type from Paramo de Macotama, Colombia; altitude, 11,000 feet. No. 6112, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 3, 1899, by W. W. Brown, Jr.

Specific characters.—Much larger than *M. semifusca* Scl., with much longer tail; bill longer and more slender, base of lower mandible black (yellowish in *semifusca*); tertials not so large nor so broadly rounded at ends; breast darker olive; pileum much darker than back. Sexes similar.

Color.—Pileum dark grayish olive; back and rump olive; lores, supra-orbital and supra-auricular streak, orbital ring, and most of auriculars grayish; a dusky post-ocular streak; wings dusky; wing-coverts broadly tipped with dull tawny ochraceous, forming two broad wing bars; outer edges of secondaries tawny-ochraceous toward ends, wholly blackish at base, thus forming a blackish patch on closed wing just behind the second wing bar; edges and tips of tertials dull yellowish white (in some specimens, all in worn plumage with abraded feathers, the wing bars and edges of secondaries are all dull yellowish white); tail dusky, narrowly edged with olive and sometimes (in fresh plumage) tipped with isabella color; throat grayish white; breast grayish olive; belly and under tail-coverts primrose yellow; flanks olive; lining of wing and bend of wing pale yellowish; bill wholly blackish.

Measurements.—Type, adult ♂: Wing, 66.6; tail, 69; tarsus, 20.2; exposed culmen, 9.6. Adult ♀, No. 6104, from Macotama: Wing, 70; tail, 69; tarsus, 20.2; exposed culmen, 10. (These two examples exhibit the extremes in wing measurement in the series of eighteen specimens.)

Remarks.—When collecting in the lowlands and among the smaller mountains near Santa Marta, Mr. Brown took six examples of true *M. semifusca*. These are topotypes of the species. In the high mountains, from altitudes of 9,000 to 12,000 feet, he secured a series of eighteen specimens of a wholly different bird, which I have here called *M. montensis*. The differences between the two are so great as to seem almost more than specific; the very long tail, long slender, wholly black bill, and the differently shaped tertials of the mountain bird are very marked characters.

In ascending the mountains there seems to be a belt of from 6,000 to 9,000 feet where neither *M. semifusca* nor *M. montensis* is found. This belt has been pretty thoroughly worked by Mr. Brown at many different points, and I feel sure he would have taken *Myiopatis* if it occurred there.

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* Montensis, belonging to mountains.

Tyranniscus nigricapillus (Lafr.).

Two females, one from La Concepcion Mar. 11, 1899, the other from Chirua Feb. 13, 1899.

Nuttallornis borealis (Swains.).

One female from La Concepcion Mar. 8, 1899.

Pipreola aureipectus decora* subsp. nov.

Two specimens, male and female, from Chirua.

Type, from Chirua, Colombia; altitude, 7,000 feet. No. 6173, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 12. 1899, by W. W. Brown, Jr.

Subspecific characters.—Much smaller than true *P. aureipectus*, with much shorter tail. Similar in color and markings to true *P. aureipectus*, except that the ♂ has a broad band of yellow on each side, extending from the yellow throat across side of neck behind auriculars; in the ♀ this band shows as a row of yellow spots.

Measurements.—Type, adult ♂: Wing, 88; tail, 64; tarsus, 23; exposed culmen, 12. Adult ♀, topotype No. 6147: Wing, 84; tail 64; tarsus, 21.4; exposed culmen, 11.8.

Remarks.—I have examined Lafresnaye's types, consisting of three specimens, two males and one female, in splendid condition. They are, all three, much larger than the Chirua bird, their wing measurements being as follows: No. 2166,* ♂ adult, 92; No. 2167,* ♂ adult, 94; No. 2168,† ♀ adult, 92. The tail and tarsus also give larger measurements. In the two Lafresnaye males there are a few concealed yellow spots on the sides of the neck, where in the new form there is a broad yellow band. In the female there is no trace of yellow spots on the sides of the neck. Otherwise the colors and markings are about the same in *P. aureipectus decora* and in true *P. aureipectus*.

Heliochera rubrocristata (D'Orb. and Lafr.).

Ten specimens, all from Paramo de Chiruqua and Paramo de Macotama, at altitudes ranging from 11,000 to 15,000 feet.

Cinclodes fuscus albidiventris (Scl.).

Two males from Paramo de Chiruqua, 15,000 feet. These two specimens, without doubt, belong to the form called *albidiventris* by Sclater, which is a valid subspecies, quite different in color from the more southern form—true *fuscus*. In the northern form the scaly markings come farther down on the breast and sides, and the belly is whitish, not buffy, as in true *fuscus*.

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* Decorus, adorned, ornamented.

† Specimens in Lafresnaye collection in Boston Society of Natural History.

Sclerurus albigularis propinquus subsp. nov.

Type (and only specimen secured on this trip*), from Chirua, Colombia; altitude, 7,000; No. 6152, ♀ adult, coll. of E. A. and O. Bangs. Collected Feb. 7, 1899, by W. W. Brown, Jr.

Subspecific characters.—Somewhat intermediate between *S. canigularis* Ridgw., of Costa Rica, and true *S. albigularis* of Venezuela, most like the former but with pectoral band paler; throat lighter gray; upper parts duller brown, not chestnut. The new form is also the smallest of the three.

Color.—Back burnt umber with a slight olive cast, head rather more dusky; rump and upper tail-coverts bright chestnut; wings dark brown, primaries, tertials, and secondaries edged with burnt umber; primary coverts dusky-brown; greater and lesser coverts and scapulars chestnut; throat smoke-gray; pectoral band dull ferruginous; belly and flanks hair-brown, some of the feathers edged and tipped with dull yellowish-ferruginous; under tail-coverts chestnut; tail blackish edged with chestnut; 'iris hazel; tarsus dusky;'† culmen dusky; mandible yellowish toward base, dusky at tip.

Measurements.—Type, adult ♀: Wing, 82.6; tail, 56.4; tarsus, 23; exposed culmen, 21.8. No. 5684, ♀ adult, from Palomina: Wing, 83; tail, 56; tarsus, 23.2; exposed culmen, 21.

Remarks.—The second specimen (the type) of this form secured by Mr. Brown is just like the first, which could not be referred to either *S. canigularis* or *S. albigularis.*‡ I therefore no longer hesitate to give it a name.

Siptornis antisiensis Scl.

Five specimens, from Santa Cruz, Paramo de Macotama, and Paramo de Chiruqua.

Siptornis wyatti Scl. and Salv.

Two specimens, male and female, from Paramo de Chiruqua, 15,000 feet, Mar. 25, 1899.

Automolus rufipectus Bangs.

Seven specimens, taken at different altitudes from 3,000 to 7,500 feet. All are similar to the type, which before was unique.

Anabazenops striaticollis Scl.

Eight specimens, from Chirua, San Miguel, and La Concepcion.

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* Mr. Brown took a female at Palomina, May 18, 1898.

† Noted by Mr. Brown from fresh specimen.

‡ Proc. Biol. Soc. Washington, vol. XII, p 177, 1898.

Premnoplex brunnescens (Scl.).

Two females, one from San Miguel, the other from Chirua.

Dendrocincla olivacea anguina Bangs.

Three specimens, one each from Palomina, Chirua, and La Concepcion. All are similar to the type, the only specimen Mr. Brown had previously taken.

Picolaptes lacrymiger (Des Murs.).

One female from La Concepcion.

Drymophila caudata (Scl.).

Twenty-five specimens, young and adult of both sexes, from Chirua, La Concepcion, San Francisco, Santa Cruz, San Antonio, and San Miguel. I am now inclined to consider the Santa Marta bird true *D. caudata* (Scl.), although when I recorded the first two, taken by Mr. Brown at Palomina,* I thought that they were not that species. The tails are about the same throughout the series and do not differ, to any extent, with age or sex. The rectrices are dark brown (between raw umber and bister), with subapical black bands and white tips. The only specimen from 'Bogota' in the National Museum has a precisely similar tail. Sclater's description reads: 'Tail of ten feathers, very long, much graduated, black, with white ends.' This was probably a mistake.

Conopophaga browni† sp. nov.

Five specimens, both sexes, from Chirua.

Type, from Chirua, Colombia; altitude, 7,000 feet. No. 6177, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 12, 1899, by W. W. Brown, Jr.

Specific characters.—A very distinct species, apparently representing a new group, having sides of head and cap like the back and without white post-ocular stripe or patch.

Color.—Forehead tawny-olive, passing insensibly into color of upper parts; lores yellowish white; upper parts, yellowish olive; wings dusky brown, outer edges of primaries, secondaries, and tertials dull olivaceous cinnamon; tertials and secondaries bordered on inner web and tipped with clear cinnamon; tail sepia; a narrow orbital ring yellowish white; auriculars reddish olive; throat, breast, sides, and lining of wing ochraceous (in some specimens there is some white on the throat, in others the throat is uniform with the breast); middle of belly and under tail-coverts white, varying in extent in different specimens; culmen dusky; mandible yellowish toward base, dusky at tip.

Measurements.—Type, adult ♂: Wing, 61; tail, 29; tarsus, 23.2; exposed culmen, 13. Adult ♀, No. 6179, topotype: Wing, 62; tail, 29.4; tarsus, 23.6; exposed culmen, 12.4.

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* Proc. Biol. Soc. Washington, vol. XII, p. 176, 1898.

† Named for Wilmot W. Brown, Jr., whose researches have brought to light so many new birds in the Santa Marta region.

Remarks.—*C. browni* does not need comparison with any known form. The one female recorded from Pueblo Viejo, 8,000 feet,* is like the present series from Chirua.

Scytalopus sylvestris Tacz.

One male, not fully adult, from San Francisco Jan. 24, 1899. It is not unlikely that fully adult specimens will show the Santa Marta bird to be an undescribed species. The wing measures 46 mm., which is shorter than usual in *S. sylvestris.* I have compared it with *S. argentifrons* Ridgw., and it is certainly not that species. For the present it may be well to call it *sylvestris.*

Scytalopus latebricola† sp. nov.

Seven specimens, six females and one male, from Paramo de Chiruqua and Paramo de Macotama, 11,000 to 12,000 feet.

Type, from Paramo de Chiruqua, Colombia; altitude, 12,000 feet. No. 6208, ♀ adult, coll. of E. A. and O. Bangs. Collected March 10, 1899, by W. W. Brown, Jr.

Specific characters.—*Scytalopus latebricola* has the large feet, tarsus, and bill of the *S. analis* group, but in size is smaller and has a much shorter tail than *S. analis.* Colors different, much more reddish brown on rump, flanks, and upper tail-coverts. Sexes apparently alike.

Color.—Adult, head and back dark brownish slate; lower rump and upper tail-coverts chestnut, with indistinct blackish cross-bars; wings and tail dull brownish black; throat and breast brownish slate gray (almost mouse gray of Ridgway), paler and more silvery on middle of lower breast and upper part of belly; flanks, lower sides, and under tail-coverts chestnut, with slight irregular spots and cross-bars of dusky; bill horn color; feet and tarsus brown.

Younger birds (Nos. 6212 and 6210) differ in having more chestnut on the back and breast, in being more decidedly barred on flanks, etc., and in having tertials and wing-coverts barred with chestnut and tipped with yellowish brown, and primaries edged with chestnut.

Measurements.

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed culmen.
6208, type.............	♀ ad.	60.	42.2	23.8	13.4
6211..................	♀ ad.	61.	42.6	24.2	13.4
6213..................	♂ ad.	62.	....	24.4	13.6

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* Proc. Biol. Soc. Washington, vol. XII, p. 159, 1898.

† Latebricola, one who dwells in coverts or lurking-places.

Remarks.—I have carefully examined Lafresnaye's type of *Merulaxis analis*, which is in fairly good condition. It is a very different bird from that taken by Mr. Brown in the Sierra Nevada de Santa Marta; is much larger and has a very much longer tail. The colors are also different, but as the specimen appears to be now somewhat faded by exposure to light, it might only make confusion to mention these differences. It measures—wing, 66; tail, 63.2; tarsus, 28.

In the National Museum I examined specimens from Bogota of still another form, which is probably *S. micropterus* (Scl.). This differs from *S. latebricola* in being much darker throughout, the back blacker, the underparts not nearly so gray, and the reddish brown of the flanks and rump darker.

Sycalis browni Bangs.

Two specimens, one adult (female?), the other a young male, from Palomina and La Concepcion.

When identifying the specimens of this bird which Mr. Brown took near Santa Marta, Mr. Ridgway and I were misled by Dr. Sharpe's rather strange treatment of *Sycalis citrina*, which is placed in the far-removed genus *Pseudochloris*. Consequently we overlooked that species.

There is little doubt that the birds recorded in the 'British Museum Catalogue' from Colombia are the same as my *S. browni*. It is probable, however, that *S. browni* will prove subspecifically different from *S. citrina* Pelzeln, the latter being based on birds from southern Brazil. It would in fact be very strange if birds of this sort from localities so far apart as southern Brazil and northern Colombia should not prove different. In the lack of Brazilian specimens for actual comparison, I am forced to leave the question in this unsatisfactory condition.

Oryzoborus funereus Scl.

Five specimens from Chirua and La Concepcion.

Catamenia sp. ?

One female from Paramo de Chiruqua, 15,000 feet, Feb. 27, 1899.

With but one female I am unable to identify the species positively. It may prove to be undescribed or may possibly be *C. analoides*.

Haplospiza nivaria* sp. nov.

Thirteen specimens from Paramo de Chiruqua, 15,000 feet, Feb. and Mar. 1899.

Type, from Paramo de Chiruqua, Colombia; altitude, 15,000 feet. No. 6238, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 25, 1899, by W. W. Brown, Jr.

Specific characters.—Much larger than *H. unicolor;* ♂ purer gray, less olivaceous; back more streaked; bill relatively smaller. The feathers everywhere very long and lax, and the whole plumage indicating a bird fitted to withstand extreme cold.

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* Nivarius, of or belonging to snow.

Color.—Adult ♂: Upper parts dark gray, between mouse gray and slate color; interscapulum with indistinct longitudinal dusky streaks; some of the feathers slightly edged with pale smoke gray; wings black, all the feathers edged with gray like the back; tail black, with narrow gray edges; under parts gray (No. 6 of Ridgway); center of belly and under tail coverts somewhat varied by indistinct cross-bars of pale smoke gray; bill, feet, and tarsus black; 'iris hazel.'*

Adult ♀: Heavily streaked throughout; upper parts sepia, rather paler on cervix and shading into brownish slate on rump and upper tail-coverts, with broad blackish striations; wings dusky brown edged with sepia, except greater and middle coverts, which are edged with isabella color; tail dusky brown edged with grayish; throat, breast, flanks, and sides wood brown; belly and under tail-coverts grayish white; under parts streaked throughout with blackish, most heavily on breast and sides, less so on throat and center of belly; bill blackish, base of lower mandible paler, more yellowish.

Measurements.

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed culmen.
6238, type	♂ ad.	82.	59.	23.	10.
6240	♂ ad.	83.	60.	23.	10.2
6246	♀ ad.	81.	59.	23.4	10.
6244	♀ ad.	82.	57.	23.4	10.2

Remarks.—I am, of course, not familiar with *H. uniformis* Scl. and Salv. of Jalapa, Mexico, the type being unique, but the description indicates a very different bird from mine, and the measurements show it to be smaller.

Mr. Brown found the new species at the edge of snow, at 15,000 feet, on El Paramo de Chiruqua, where he took thirteen specimens in Feb. and March, 1899. At no other station in the mountains did he get specimens. Some of the birds taken in February were moulting.

Myospiza manimbe (Licht.).

One female from Paramo de Macotama, 9,000 feet, Mar. 3, 1899.

Arremonops caneus † Bangs.

At Mr. Ridgway's request I sent him, a short time ago, the three specimens upon which I based this form. He detected an error in my former account of them that must be corrected. The type, adult male, is all right, and is so different from *A. conirostris* as to deserve full specific rank. The two females that I included under the same name, however, prove not to belong to this species at all, but are so close to examples of *A. venezuelensis* Ridgway, that Mr. Ridgway does not consider them even subspecifically separable. Thus another species should be added to the fauna of the Sierra Nevada de Santa Marta.

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* Noted by Mr. Brown from fresh specimens.

† Described as *Arremonops conirostris caneus* Bangs, Proc. Biol. Soc., Washington, vol. XII, p. 140, June 3, 1898.

Arremonops venezuelensis Ridgw.

Two females taken near Santa Marta in Jan., 1898. This is a much smaller bird than *A. caneus*, besides being different in color. The back is pure greenish olive, this color also suffusing the gray of neck and crown. *A. caneus* has the whole head (between black stripes), neck, and upper back gray, gradually shading into grayish olive on lower back and rump.

Buarremon basilicus Bangs.

Four specimens, three males and one female, from Chirua and San Francisco. I founded this species upon one adult male taken at Pueblo Viejo at an altitude of 8,000 feet, and the three males in the present series agree with it exactly. The female is rather smaller and slightly different in color, the main difference being that the olive of the back extends up the crown between the two black stripes. In the males this central crown stripe is gray.

Schistochlamys atra (Gmel.).

Eleven specimens, both sexes, from La Concepcion and San Antonio.

Pœcilothraupis melanogenys Salv. and Godm.

Twenty specimens, taken at all stations between 7,500 and 12,000 feet. Of this beautiful tanager, peculiar to the Santa Marta mountains, Mr. Brown had before taken but one specimen.

Chlorophonia frontalis (Scl.).

Ten specimens, both sexes, from Chirua, La Concepcion, and San Miguel. Without specimens from Venezuela for comparison, I must let the Santa Marta bird stand as *C. frontalis.*

Piranga faceta Bangs.

Four examples, one adult male and three young males, from La Concepcion and San Miguel. The adult is in every way similar to the type, but is in much more worn plumage. The young males are in a plumage similar to that of the adult female, except that orange red feathers are appearing in small irregular patches both above and below.

Atticora cyanoleuca (Vieill.).

Seven specimens, both sexes, all from La Concepcion; altitude, 3,000 feet.

Vireo josephæ (Scl.).

One male from El Paramo de Macotama. 11,000 feet, Feb. 3, 1899.

Conirostrum rufum Lafr.

Five specimens, both sexes, from Paramo de Chiruqua and Paramo de Macotama; altitude, 11,000 feet.

Helminthophila pinus (Linn.).

One adult male, Chirua, Mar. 21, 1899. This bird is interesting, having broad, conspicuous yellow wing bars.

Seiurus noveboracensis (Gmel.).

Two specimens; male from La Concepcion, Mar. 17, 1899, and a female from Chirua, Feb. 13, 1899.

Seiurus noveboracensis notabilis (Ridgw.).

One male from Chirua, Feb. 7, 1899.

Geothlypis philadelphia (Wils.).

Ten specimens, both sexes, from Chirua and La Concepcion, taken from Feb. 12 to Mar. 25, 1899. Most of these birds are molting, and the series covers practically the complete spring molt.

Cinclus rivularis[*] sp. nov.

Three specimens, two from Chirua, one from Paramo de Chiruqua; altitude, 11,000 feet.

Type, from Chirua, Colombia; altitude, 7,000 feet. No. 6049; ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 7, 1899, by W. W. Brown, Jr.

Specific characters.—Not much like either *C. leuconotus* or *C. leucocephalus;* general color more grayish and less blackish; under parts dark gray mottled with white; pileum white streaked with dusky; throat white; cheeks dark gray.

Color.—Pileum white, the center of the feathers dusky, giving a streaked appearance; back slate color, the lower parts of the feathers white centrally (the white does not show unless the feathers are disturbed); rump and upper tail-coverts dark brownish slate color; wings brownish black, inner webs of primaries and secondaries with white central spots, this white marking small and inconspicuous on second and third primaries, larger on the other feathers; tail brownish black; cheeks dark slate; throat white; breast, belly, and under tail-coverts dark slate, irregularly mottled and varied with white. (In the type there is but little white, mostly concealed, on under parts; in a topotype there is rather more; in the specimen from Paramo de Chiruqua the center of breast and belly is considerably mottled with white). Flanks and sides brownish slate; 'front of tarsus light blue, behind dusky; iris hazel;'* bill black.

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[*] Rivularis, of or belonging to a small stream, rivulet.

Measurements.—Type, adult ♂: Wing, 88; tail, 47; tarsus, 30.6; exposed culmen, 12. Adult ♀, No. 6050, from Paramo de Chiruqua: Wing, 82; tail, 44; tarsus, 29.4; exposed culmen, 12.

Troglodytes monticola † sp. nov.

Five specimens, adult male and female, and three young, from Paramo de Chiruqua and Paramo de Macotama, from 11,000 to 15,000 feet.

Type from Paramo de Chiruqua, Colombia; altitude, 15,000 feet. No. 6066, ♀ adult, coll. of E. A. and O. Bangs. Collected Mar. 25, 1899, by W. W. Brown, Jr.

Specific characters.—With a distinct superciliary streak as in *T. brunneicollis* of southern Mexico and *T. rufociliatus* of Guatemala. Larger than either of these and differing much in color and markings.

Color.—Adult ♀, type, in fresh plumage: Pileum and cervix rich russet; back, rump, upper tail-coverts, scapulars, tertials, and wing-coverts russet, finely, but strongly, barred with dusky; primaries and secondaries dusky, with dull yellowish-white notches along outer webs; tail dusky, with irregular, wavy cross-bars (often broken) of dull grayish brown; conspicuous superciliary streak tawny-ochraceous; auriculars tawny, just behind eye darker, almost dusky; throat and jugulum ending in an even line, dull tawny-ochraceous; breast, in the middle pinkish buff, toward sides buff with dusky cross-bars; belly soiled white, with dusky cross-bars; flanks and sides dull buff, with broad dusky cross-bars; under tail-coverts white, with dusky cross-bars.

An adult ♂, No. 6017, from Paramo de Macotama, Mar. 11, 1899, is similar, but is in worn plumage, the feathers being considerably abraded. The color above is richer, bordering on hazel, and the cross bars on back are less distinct; below it is more deeply colored, and the differences in shade between throat, breast, and belly are less evident. All these differences are probably due to wearing of the feathers.

The young differ from adults in being less barred above and in having the under parts isabella color—a little darker on sides—freckled with dusky. The new feathers appearing on the throat are like those of the adult.

Measurements.—Type, adult ♀: Wing, 54; tail, 39.4; tarsus, 21; exposed culmen, 11.8. Adult ♂, No. 6067: Wing, 54; tail, 39.6; tarsus, 22; exposed culmen, 12.2.‡

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* Noted by Mr. Brown from a fresh specimen—the type.

† *Monticola*, a mountaineer, dweller in the mountains.

‡ The wings and tail of the male are somewhat worn, and therefore these measurements are a little too short.

Remarks.—The discovery of this wren in the higher Sierra Nevada carries the range of the group of house wrens having conspicuously colored superciliaries into South America proper. The species is very different from either of the two before known.

Microcerculus marginatus Scl.

One adult male from Chirua, Mar. 13, 1899.

Hylocichla ustulata swainsoni (Cab.).

One female from Chirua, Feb. 16, 1899.

Merula gigas cacozela Bangs.

Eighteen specimens, taken at San Miguel, Paramo de Chiruqua, and Paramo de Macotama. All agree with the original pair from Macotama, upon which I based the subspecies.

Merula olivatra Lafr.

Two males from La Concepcion; altitude, 3,000 feet.

I have compared these with the types of *Merula olivatra* which are in the collection of the Boston Society of Natural History. There are two specimens in fine condition and apparently only a little faded, though they were for some years exposed to the light as mounted specimens. In color they agree with the two skins taken by Mr. Brown, when due allowance is made for the slight fading that has undoubtedly taken place. They are, however, smaller in every proportion. The wing measurement of the two Lafresnaye types is 115 and 118 mm. respectively, while in the La Concepcion birds, both males, it is 122 and 124 mm.

When we know more about the range and variations of this rare thrush it may be found that there are two races. For the present I prefer to leave the Colombian bird with true *M. olivatra.*

Merula albiventris fusa[*] subsp. nov.

Fourteen specimens, both sexes, from Chirua, La Concepcion, San Miguel, and San Francisco. Taken in Jan., Feb., and Mar., 1899.

Type, from Chirua, Colombia; altitude, 7,000 feet. No. 6080, ♀ adult, coll. of E. A. and O. Bangs. Collected Feb. 11, 1899, by W. W. Brown, Jr.

Subspecific characters.—Much larger than true *M. albiventris* Spix, of Brazil; colors and pattern of coloration similar, except that the head is grayer—shading from grayish olive on forehead and crown to olive gray on cervix, where the gray meets the olive of the back much more abruptly. 'Bill dull green; iris brown;'[†] sexes alike.

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[*] Fusus, large, plump, full.

[†] Noted by Mr. Brown from fresh specimen.

Measurements.

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed culmen.
6080, type	♀ ad.	124	103	32.5	19.5
6071	♂ ad.	121.5	100	32	20
6074	♂ ad.	122	99.5	31.5	20
6076	♂ ad.	120	98.5	32.5	19.5
6079	♀ ad.	120.5	103	32	20
6078	♂ ad.	120.5	100	32.5	20
6072	♂ ad.	119.5	98	33	19.5
6073	♀ ad.	118	96	31	19.5
6075	♀ ad.	117.5	96	31.5	20
6077	♂ ad.	119	96	32	19.5

Remarks.—This new form of the white-bellied thrush is in all probability not confined to the Sierra Nevada de Santa Marta. but is a large northern subspecies. True *M. albiventris* of Brazil is a much smaller bird, besides differing somewhat in the color of the head. The young bird, in nestling plumage, from Palomina, taken May 21, 1898, that I recorded as probably the young of *Merula incompta*,* proves on examination to be the young of *M. albiventris fusa.*

Merula phæopyga minuscula Bangs.

Ten specimens, nine males and one female, from La Concepcion and Chirua. All these agree closely with the original specimens.

Platycichla flavipes carbonaria (Licht.).

Seven specimens, both sexes, from Chirua, La Concepcion, and San Miguel.

Catharus fuscater (Lafr.).

One adult male from Chirua, Feb. 5, 1899. 'Iris white; orbital ring reddish orange; bill reddish orange, but apex of culmen dusky; tarsus light orange.' †

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* Proc. Biol. Soc. Washington, vol. XII, p. 182, 1898.

† Noted by Mr. Brown from the fresh specimen.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE BOTANICAL EXPLORATIONS OF THOMAS NUTTALL IN CALIFORNIA.

BY FREDERICK V. COVILLE.

I was puzzled recently, in reading some references to Thomas Nuttall's botanical work in California, at discrepancies in various statements regarding time and place, and this led to a careful examination of the available records regarding his work in that State.

Professor W. H. Brewer,* to whom one naturally turns for information about botanical explorations in California, states that Nuttall's collections there were made "during a part of the year 1835." This there was reason to doubt, and looking further I found that Professor Brewer's authority for the statement was probably Elias Durand's "Biographical notice of the late Thomas Nuttall."†

In this article Durand states, on page 311:

> "There [at the Sandwich Islands] he remained a couple of months [after January 5, 1835], visiting the different islands of that happy group and collecting plants and sea-shells; thence, separating from his companion, Mr. [John K.] Townsend, he took passage on board a vessel sailing for the coast of California, where he landed early in the spring, to enjoy new emotions of pleasure. All again was new to him! He remained in California a great part of the spring and summer, actively engaged in making collections, and returned to the Sandwich Islands,

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* In Brewer & Watson, Bot. Cal., II, 555, 1880.

† Proc. Am. Phil. Soc., VII, 297–315, 1861.

> where he embarked on a Boston vessel to come back to the United States round Cape Horn. Mr. Nuttall arrived in Boston in the beginning of October, 1835."

This statement of Durand, it now appears, is incorrect in that Nuttall did not separate from Townsend in the Hawaiian Islands, did not sail at this time for California, did not spend the following spring and summer in California, did not embark for Boston from the Hawaiian Islands, and did not reach Boston in 1835.*

Nuttall, in company with Townsend, embarked at Honolulu, Hawaiian Islands, March 26, 1835, on the American brig *May Dacre* and entered the mouth of the Columbia on April 16 following.†

Under date of July 11, 1835, Mr. Townsend states ‡ that Nuttall "has just returned from the Dalles, where he has been spending some weeks." Under date of October 1, 1835, referring to a Hudson Bay Company's vessel in which Dr. Gairdner, one of the company's surgeons, had sailed a few days before from the mouth of the Columbia to the Hawaiian Islands, Townsend says:

> "My companion, Mr. Nuttall, was also a passenger in the same vessel. From the [Hawaiian] islands he will probably visit California, and either return to the Columbia by the next ship and take the route across the mountains or double Cape Horn to reach his home."

From the records thus cited it is evident that Nuttall spent the spring and summer of 1835 on the Columbia River in Oregon and Washington, not in California. It may seem strange to the reader that Nuttall, wishing to go to California from the Columbia, did not make the journey overland, or at least take a vessel down the coast. The fact is that he did not do this simply because he could not. Up to that time there was no land route from the Willamette to the Sacramento across the mountains of the Umpqua and the Rogue rivers and the terrible Siskiyous. As for a coastwise vessel from the Columbia to a California port, that was a rare occurrence. The trade of the

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* Since this article was written Dr. John W. Harshberger's book on "The Botanists of Philadelphia and Their Work" has appeared, with the same errors, doubtless also on the authority of Durand.

† Townsend, John K. Narrative of a journey across the Rocky Mountains, etc., pages 215, 218, 1839.

‡ Op. cit., 224.

Columbia was exclusively a fur trade, and, while the trading vessels went frequently to the Hawaiian Islands to get provisions or sometimes to take on a cargo of sandal-wood for delivery at some eastern Asiatic port, they seldom had occasion to stop in California as they sailed to or from Cape Horn.

Of Nuttall's movements immediately after the 1st of October, 1835, we have only an indirect record. Presumably he reached Honolulu, as he intended, and certainly he must have sailed almost immediately for California, for his collections from the Hawaiian Islands are very scanty and probably, indeed, were all made during his previous visit there.

In the absence of any direct account of Nuttall's movements in California, it seemed best to collate the type localities of the new species of plants described by him as collected in that State, and with this in view a search has been made through the works in which most of these California collections were published, namely, the seventh and eighth volumes of the Transactions of the American Philosophical Society, new series, 1840 to 1843, and in Torrey and Gray's Flora of North America, 1838 to 1843. As a result, it appears that Nuttall's California collections were made at Monterey, Santa Barbara, San Pedro (the port of Los Angeles), and San Diego, in March, April, and May, 1836. He did not visit the California coast north of Monterey.

At San Diego Nuttall secured passage for Boston on the vessel *Alert*, which was carrying a load of hides from California to New England by way of Cape Horn. She left San Diego May 8, 1836. This voyage has an added interest from the fact that the vessel carried also the Massachusetts boy, R. H. Dana, who afterward wrote "Two Years before the Mast." His references to Nuttall are interesting.

> "This passenger, the first and only one we had had [on board the trading vessel *Alert*, of Boston], except to go from port to port, on the coast, was no one else than a gentleman whom I had known in my better days, and the last person I should have expected to have seen on the coast of California, Professor [Thomas] N[uttall], of Cambridge, [Massachusetts]. I had left him quietly seated in the chair of Botany and Ornithology, in Harvard University, and the next I saw of him was strolling about San Diego beach, California, in a sailor's pea-jacket, with a wide straw hat, and barefooted, with his trousers rolled up to his knees, picking up stones and shells. He had traveled overland to the Northwest Coast, and come down in a small vessel to Monterey. [Dana evidently knew nothing about Nuttall's trips to the Hawaiian Islands.] There he learned that

there was a ship at the leeward about to sail for Boston, and, taking passage in the *Pilgrim*, which was then at Monterey, he came slowly down, visiting the intermediate ports and examining the trees, plants, earths, birds, &c., and joined us at San Diego shortly before we sailed. The second mate of the *Pilgrim* told me that they had got an old gentleman on board who knew me and came from the college that I had been in. He could not recollect his name, but said he was a 'sort of an oldish man,' with white hair, and spent all his time in the bush and along the beach, picking up flowers and shells and such truck, and had a dozen boxes and barrels full of them. I thought over everybody who would be likely to be there, but could fix upon no one, when, the next day, just as we were about to shove off from the beach, he came down to the boat in the rig I have described, with his shoes in his hand and his pockets full of specimens. I knew him at once, though I should not have been more surprised to have seen the Old South steeple shoot up from the hide-house.

He probably had no less difficulty in recognizing me. As we left home about the same time, we had nothing to tell one another; and, owing to our different situations on board [Dana had shipped as a common sailor, in the forecastle], I saw but little of him on the passage home. Sometimes, when I was at the wheel of a calm night, and the steering required no attention, and the officer of the watch was forward, he would come aft and hold a short yarn with me; but this was against the rules of the ship, as is, in fact, all intercourse between passengers and the crew. I was often amused to see the sailors puzzled to know what to make of him, and to hear their conjectures about him and his business. They were as much puzzled as our old sailmaker was with the captain's instruments in the cabin. He said there were three: the *chro*nometer, the *chre*nometer, and *the*nometer (chronometer, barometer, and thermometer). The *Pilgrim's* crew christened Mr. N[uttall] "Old Curious," from his zeal for curiosities, and some of them said that he was crazy, and that his friends let him go about and amuse himself in this way. Why else a rich man (sailors call every man rich who does not work with his hands and wears a long coat and cravat) should leave a Christian country, and come to such a place as California, to pick up shells and stones, they could not understand. One of them, however, an old salt who had seen something more of the world ashore, set all to rights, as he thought: 'Oh, 'vast there! You don't know anything about them craft. I've seen them colleges, and know the ropes. They keep all such things for curiosities, and study 'em, and have men a' purpose to go and get 'em. This old chap knows what he's about. He a'n't the child you take him for. He'll carry all these things to the college, and if they are better than any that they have had before, he'll be head of the college. Then, by-and-by, somebody else will go after some more, and if they beat him, he'll have to go again, or else give up his berth. That's the way they do it. This old covey knows the ropes. He has worked a traverse over 'em, and come 'way out here, where nobody's ever been afore, and where they'll never think of coming.' This explanation satisfied Jack; and as it raised Mr. Nuttall's credit for capacity, and was near enough to the truth for common purposes, I did not disturb it. With the exception of Mr. Nuttall, we had no one on board but the regular ship's company, and the live stock." *

On July 22, 1836, after a hard and protracted storm off the southern coast of South America, Dana states:

> "Even Mr. Nuttall, the passenger, who had kept in his shell for nearly a month, and hardly been seen by anybody, and who we had almost forgotten was on board, came out like a butterfly, and was hopping around as bright as a bird." †

And again:

> "In the general joy, Mr. Nuttall said he should like to go ashore upon the island [Staten Island, a little east of Cape Horn] and examine a spot which probably no human being had ever set foot upon; but the captain intimated that he would see the island—specimens and all—in—another place before he would get out a boat or delay the ship one moment for him." ‡

On the 21st of September, 1836, Nuttall arrived in Boston, thus ending his last important American journey.

It is important that the new species based on Nuttall's Californian collections be critically identified, and since to many Californian botanists both the type specimens and the original descriptions are not readily accessible, the following list of species has been prepared. The list, arranged by type localities, includes the species described in Torrey and Gray's Flora of North America, 1838 to 1843, and in the seventh and eighth volumes of the Transactions of the American Philosophical Society, new series, 1840 to 1843. After the original name is given the current equivalent, if different from the original, and any additional information suggested by the first description, such as the habitat, precise locality, date of collecting or flowering, probable misidentification, or incorrect use of a name. No attempt has been made to identify the species critically. It is hoped that this information will be used by Californian botanists in making collections of these plants at their type localities, so that ample material for careful study may be available in American herbaria.

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* [Dana, R. H.] Two Years before the Mast, 359–361, 1840.

† Op. cit., 412.

‡ Op. cit., 412–413.

LIST OF PRINCIPAL NEW SPECIES BASED ON NUTTALL'S CALIFORNIAN COLLECTIONS.

Collected at Monterey.

BRASSICACEAE.

Dentaria integrifolia Nutt. Plains of Monterey.

Erysimum grandiflorum Nutt. = *Cheiranthus capitatus* Dougl. On the sand hills of Point Pinos, near Monterey. March.

Lepidum californicum Nutt. = *Lepidium menziesii* DC. It may be well to note that although *L. californicum* is referred by recent authors to *L. menziesii*, the latter is considered by Dr. Robinson in the Synoptical Flora a plant of the Northwest Coast, a district far removed phytogeographically from Monterey. This suggests the need of further critical examination of the Monterey plant.

VICIACEAE.

Drepanolobus lanatus Nutt. = *Lotus tomentosus* (Hook. & Arn.) Greene. Dry hills in the shade, near Monterey.

Hosackia micranthus [-tha] Nutt. = *Lotus hamatus* Greene. Near Monterey, March to April.

Hosackia nudiflora Nutt. = *Lotus nudiflorus* (Nutt.) Greene. Gravelly hills near Monterey, March.

Hosackia strigosa Nutt. = *Lotus strigosus* (Nutt.) Greene. Dry gravelly hills near Monterey, March.

RHAMNACEAE.

Ceanothus rigidus Nutt. Bushy woods near Monterey, March.

Rhamnus croceus [-cea] Nutt. Bushy hills and thickets around Monterey.

Rhamnus laurifolius [ia] Nutt. = *Rhamnus californica* Esch. The type specimens were collected near Monterey and near Santa Barbara also.

CISTACEAE.

Helianthemum scoparium Nutt. Common on dry hills around Monterey.

ONAGRACEAE.

Oenothera ovata Nutt. = *Taraxia ovata* (Nutt.) Small. Common in moist plains in the immediate vicinity of Monterey, March.

ERICACEAE.

Arctostaphylos acuta Nutt. = *Arctostaphylos pumila* Nutt., with which it was originally collected.

Arctostaphylos pumila Nutt. Around Monterey, flowering in March and April.

Xylococcus bicolor Nutt. = *Arctostaphylos bicolor* (Nutt.) Gray. This was the type species of Nuttall's genus *Xylococcus.*

CARDUACEAE.

Artemisia foliosa Nutt. = *Artemisia californica* Less. Common around Monterey.

Stylocline gnaphaloides Nutt. Near Monterey.

Collected at Santa Barbara.

RANUNCULACEAE.

Paeonia californica Nutt. Margins of bushy plains and in the mountain valleys in the vicinity of Santa Barbara, March and April.

Lepidium lasiocarpum Nutt. Near Santa Barbara.

Lepidium nitidum Nutt. Near Santa Barbara.

Streptanthus arcuatus Nutt. = *Arabis arcuata* (Nutt.) Gray. Shelving rocks on high hills near Santa Barbara.

Streptanthus repandus Nutt. This plant has remained unidentified since the publication of Nuttall's original description, and no mention of the plant is made by Dr. Watson in the Synoptical Flora. Nuttall's original description is as follows:

> " Hirsute, particularly the lower part; leaves oblong-lanceolate, elongated, clasping, angularly toothed or repand above (flowers white); petals about as long as the calyx. St. Barbara, Upper California. Stem simple, about 2 feet high. Pedicels shorter than the calyx. Sepals and petals linear."

Thysanocarpus crenatus Nutt. This plant and the following are usually treated as belonging to the same species, *crenatus* being made a variety of *laciniatus. Crenatus*, however, by the rule of precedence is the proper specific name.

Thysanocarpus laciniatus Nutt. See remarks under the preceding.

RESEDACEAE.

Ellimia ruderalis Nutt. = *Dipetalia subulata* (Del.) Kuntze. This plant was the type of Nuttall's genus *Ellimia.*

SAXIFRAGACEAE.

Lithophragma cymbalaria Torr. & Gr. Shady woods near Santa Barbara.

RIBACEAE.

Ribes villosum Nutt. This is commonly referred to *Ribes divaricatum* Dougl., a species of the Northwest Coast. Nuttall found it common on the plain near the village of Santa Barbara.

ROSACEAE.

Alchemilla cuneifolia Nutt. Referred by most authors to *Alchemilla arvensis* (L.) Scop. Professor Greene, however, in Flora Franciscana, page 62, maintains it as distinct from that species, basing his opinion on Nuttall's description. It was originally collected on "dry plains, St. [Santa] Barbara."

Cercocarpus betuloides Nutt. Mountains of Santa Barbara, April.

VICIACEAE.

Amorpha californica Nutt. Near the coast, May.

Hosackia crassifolia Nutt. Dr. Gray referred this plant to *Hosackia scoparia* Nutt. as a new variety, *diffusa.* Professor Greene in publishing his *Lotus glaber* (Pittonia 2: 148, 1890) cited *Hosackia scoparia* Nutt. as a synonym, but made no mention of the variety or of Nuttall's *Hosackia crassifolia.* It was collected by Nuttall on dry hillsides near the sea.

Hosackia maritima Nutt. = *Lotus salsuginosus* Greene. Clayey soils and on broken declivities near the sea, March.

Hosackia ochroleuca Nutt. = *Lotus grandiflorus* (Benth.) Greene. Shady mountain woods near Santa Barbara, March to April.

Hosackia prostratus [-ta] Nutt. = *Lotus nuttallianus* Greene. Plains near the sea, Santa Barbara, April, and also at San Diego.

Hosackia scoparia Nutt. = *Lotus glaber* (Vogel) Greene. Dry hillsides near the sea, March to April.

Phaca canescens Nutt. = *Astragalus leucopsis* (Torr. & Gr.) Torr. Borders of woods near the sea.

Phaca tricopoda Nutt. = *Astragalus tricopodus* (Nutt.) Gray. Borders of woods near the sea, April.

Pickeringia montana Nutt. = *Xylothermia montana* (Nutt.) Greene. Summits of the mountains in the vicinity of Santa Barbara. This was the type of Nuttall's genus *Pickeringia.*

Trifolium aciculare Nutt. Plains of Santa Barbara, March to April.

Trifolium polyphyllum Nutt. This is one of the clovers that have been referred by various authors, without sufficiently critical examination, to *Trifolium tridentatum* Lindl. Woods around Santa Barbara, April.

Trifolium spinulosum triste Torr. & Gr. This plant is identified by Professor Greene with *Trifolium variegatum majus* Loja, a reference which, if maintained, requires a change in the varietal name.

ANACARDIACEAE.

Rhus laurina Nutt. On bushy plains near Santa Barbara.

Styphonia integrifolia Nutt. = *Rhus integrifolia* (Nutt.) Benth. & Hook. Common on the margins of cliffs near the sea around Santa Barbara and also at San Diego.

Styphonia serrata Nutt. = *Rhus integrifolia* (Nutt.) Benth. & Hook., with which it was originally collected.

RHAMNACEAE.

Ceanothus divaricatus Nutt. Near the town of Santa Barbara and in the neighboring mountains, April.

Ceanothus hirsutus Nutt. In thickets. See note under *Ceanothus oliganthus.*

Ceanothus macrocarpus Nutt. Mountains of Santa Barbara.

Ceanothus oliganthus Nutt. Bushy woods on the hills of Santa Barbara. As indicated by Professor Greene in Flora Franciscana, page 85, the name *oliganthus* has precedence over *hirsutus* and should be used in case the two plants prove to belong to the same species.

Ceanothus spinosus Nutt. Mountains of Santa Barbara.

MALVACEAE.

Malva fasciculata Nutt. = *Malvastrum fasciculatum* (Nutt.) Greene.

Sida californica Nutt. = *Sidalcea californica* (Nutt.) Gray.

Sida delphinifolia Nutt. = Sidalcea delphinifolia (Nutt.) Greene.

APIACEAE.

Leptotaenia californica Nutt.

CAMPANULACEAE.

Dysmicodon californicum Nutt. = *Legouzia biflora* (Ruiz & Pavon) Britton. In shady woods near Santa Barbara.

CARDUACEAE.

Artemisia abrotanoides Nutt. = *Artemisia californica* Less. Near Santa Barbara.

Bahia trifida Nutt. = *Eriophyllum confertiflorum trifidum* (Nutt.) Gray.

Burrielia hirsuta Nutt. = *Baeria gracilis* (DC.) Gray.

Burrielia longifolia Nutt. = *Baeria gracilis* (DC.) Gray. Near Santa Barbara.

Burrielia parviflora Nutt. = *Baeria gracilis* (DC.) Gray. With the last.

Chrysopsis sessiliflora Nutt. Flowering in April.

Carduus occidentalis Nutt. Around Santa Barbara.

Dichaeta tenella Nutt. = *Baeria tenella* (Nutt.) Greene. On the margins of ponds and wet places, flowering in April.

Encelia californica Nutt. Common on dry hills near Santa Barbara, flowering in April.

Erigeron foliosum [us] Nutt. Near Santa Barbara, flowering in May.

Erigeron hispidum [us] Nutt. = *Erigeron glaucus* Ker.

Gnaphalium californicum erubescens Nutt. Identified by Dr. Gray in the Synoptical Flora as a form of *G. ramosissimum* Nutt., which is a later name. Near Santa Barbara.

Grindelia cuneifolia Nutt.

Hetherotheca grandiflora Nutt. On rocks near the sea, around Santa Barbara.

Isocoma vernonioides Nutt. Common in marshes near the sea, flowering in April and May.

Madaroglossa elegans Nutt. = *Blepharipappus elegans* (Nutt.) Greene.

Madaroglossa hirsuta Nutt. = *Blepharipappus platyglossus* (Fisch. & Mey.) Greene. Also at Monterey.

Madaroglossa angustifolia Nutt. = *Blepharipappus platyglossus* (Fisch. & Mey.) Greene. Collected at Monterey.

Micropus angustifolius Nutt. = *Micropus californicus* Fisch. & Mey.

Psilocarphus globiferus Nutt. Around Santa Barbara.

Psilocarphus tenellus Nutt. Near Santa Barbara, flowering in April.

Senecio coronopus Nutt. = *Senecio californicus* DC. Near Santa Barbara, flowering in May.

Solidago californica Nutt. Near Santa Barbara.

Soliva daucifolia Nutt. = *Soliva sessilis* Ruiz. & Pavon. On the dry grassy downs within the limits of Santa Barbara and in its immediate vicinity.

CICHORIACEAE.

Cryptopleura californica Nutt. = *Agoseris heterophylla* (Nutt.) Greene. Near Santa Barbara. This was the type of Nuttall's genus *Cryptopleura*.

Hieracium argutum Nutt.

Leucoseris saxatilis Nutt. = *Malacothrix saxatilis* (Nutt.) Torr. & Gr. On shelving rocks near the sea, flowering in April.

Leucoseris tenuifolia Nutt. = *Malacothrix tenuifolia* (Nutt.) Gray. On the mountains near Santa Barbara.

Collected at San Pedro.

CARDUACEAE.

Grindelia robusta Nutt. Flowering in April.

Hartmannia glomerata Nutt. = *Deinandra fasciculata* (DC.) Greene. Common, flowering in April.

Collected at San Diego.

PORTULACACEAE.

Calandrinia maritima Nutt. On the seacoast, May.

ALSINACEAE.

Loeflingia squarrosa Nutt. Sandy plains.

Polycarpon depressum Nutt. On bare sand hills, near San Diego.

RANUNCULACEAE.

Clematis lasiantha Nutt. Near the seacoast.

Clematis parviflora Nutt.=*Clematis pauciflora* Nutt. Locality the same as the last. The *rv* in parviflora is a typographical error for *uc*, as indicated in the supplement of Torrey and Gray's Flora (p. 657), and the name used by subsequent authors has therefore been *C. pauciflora* Nutt.

BRASSICACEAE.

Streptanthus heterophyllus Nutt. Bushy hills near San Diego.

CRASSULACEAE.

Echeveria lanceolata Nutt. = *Cotyledon lanceolata* (Nutt.) Benth. & Hook.

Echeveria pulverulenta Nutt. = *Cotyledon pulverulenta* (Nutt.) Baker. Flowering in May.

Sedum edule Nutt. = *Cotyledon edulis* (Nutt.) Brewer. Edges of rocks and ravines.

CAPPARIDACEAE.

Isomeris arborea Nutt. This is the type of Nuttall's genus *Isomeris.*

VICIACEAE.

Hosackia cytisoides rubescens Torr. & Gr. *Hosackia cytisoides* Benth. is now referred to *Lotus benthami* Greene, but Nuttall's *Hosackia cytisoides rubescens* seems not to have been critically identified in recent years. Collected near San Diego.

Lathyrus strictus Nutt.=*Lathyrus vestitus* Nutt. Bushy places around San Diego.

Lupinus truncatus Nutt. This species was based on two specimens, one collected by Douglas at San Francisco, the other by Nuttall at San Diego.

RUTACEAE.

Pitavia dumosa Nutt. = *Cneoridium dumosum* (Nutt.) Hook. f.

RHAMNACEAE.

Ceanothus verrucosus Nutt. Low hills near the coast.

CACTACEAE.

Cereus californicus Torr. & Gr. = *Opuntia californica* (Torr. & Gr.). *Cereus californicus* Torr. & Gr. Fl. 1, 555, 1840. *Opuntia serpentina* Engelm. Am. Jour. Sci., ser. 2, 14, 338, 1852. The original description of this plant in Torrey and Gray's Flora is as follows: "Erect and shrubby, with numerous clusters of long and short spines; the branches somewhat cylindric, repandly grooved, reticulated; flowers small, yellow; fruit dry and spiny. Arid hills and denuded tracts near St. Diego, California, common." Nuttall apparently preserved no specimen of the plant, and Torrey and Gray, having only this meager description as a guide, placed the species doubtfully in the genus *Cereus*. We now know that the two cylindrical-stemmed branching cactuses growing in the vicinity of San Diego are of the genus *Opuntia*, and that the yellow-flowered one is *Opuntia serpentina* Engelm. The earliest specific name of this plant being *californica*, it is here adopted.

Echinocactus viridescens Torr. & Gr. Arid hills near San Diego.

ONAGRACEAE.

Oenothera bistorta Nutt. = *Sphaerostigma bistorta* (Nutt.) Walp.

Oenothera epilobioides Nutt. = *Godetia epilobioides* (Nutt.) Wats.

APIACEAE.

Apiastrum angustifolium Nutt. On this and the following species Nuttall based his genus *Apiastrum*. Both were collected at San Diego in April.

Apiastrum angustifolium tenellum Nutt. This, according to Dr. J. N. Rose, appears to be only a slender form of *A. angustifolium* Nutt., with which it was originally collected.

Apiastrum latifolium Nutt. See *Apiastrum angustifolium*, to which this plant is referred by recent authors.

Deweya arguta Torr. & Gr. = *Velaea arguta* (Torr. & Gr.) Coult. & Rose. This species was the type of Torrey and Gray's genus *Deweya*.

Euryptera lucida Nutt. = *Peucedanum euryptera* Gray. Nuttall's specific name is older than Gray's and should be adopted. This was the type species of Nuttall's genus *Euryptera*, and the type specimen was collected in April in the " woods of St. [San] Diego."

RUBIACEAE.

Galium suffruticosum Nutt. = *Galium nuttallii* Gray.

CAMPANULACEAE.

Nemacladus ramosissimus Nutt. In sandy soil near San Diego. This is the type species of Nuttall's genus *Nemacladus*.

CARDUACEAE.

Aromia tenuifolia Nutt. = *Amblyopappus pusillus* Hook. & Arn. Near the coast.

Chaenactis tenuifolia Nutt. Flowering in May.

Franseria pumila Nutt. = *Ambrosia pumila* (Nutt.) Gray. Near San Diego.

Leptosyne californica Nutt. = *Leptosyne douglasii* DC. Near San Diego, flowering in the beginning of May.

Madaraglossa carnosa Nutt. = *Blepharipappus carnosus* (Nutt.) Greene.

Osmadenia tenella Nutt. = *Calycadenia tenella* (Nutt.) Torr. & Gr. Flowering in May.

Pentachaeta aurea Nutt. On dry plains near the sea, in the vicinity of San Diego, flowering in April.

Ptilomeris anthemoides Nutt. = *Baeria anthemoides* (Nutt.) Gray. Near San Diego.

Ptilomeris aristata Nutt. = *Baeria aristata* (Nutt.). *Ptilomeris aristata* Nutt. Trans. Am. Phil. Soc., new ser., 7: 382, 1841. Dr. Gray in combining *Ptilomeris aristata* and *P. coronaria* adopted the specific name *coronaria*, but by the rule of precedence *aristata* must be used. Near San Diego, flowering in April.

Ptilomeris coronaria Nutt. = *Baeria aristata* (Nutt.) Coville. Near San Diego.

Ptilomeris mutica Nutt. = *Baeria mutica* (Nutt.) Gray. With the preceding.

Tuckermannia maritima Nutt. = *Leptosyne maritima* (Nutt.) Gray. On shelving rocks near the sea.

CICHORIACEAE.

Malacomeris incanus Nutt. = *Malacothrix incana* (Nutt.) Torr. & Gr. Collected on an island in the bay of San Diego. This species was the type of Nuttall's genus *Malacomeris*.

Rafinesquia californica Nutt. = *Nemoseris californica* (Nutt.) Greene. Near the seacoast in the vicinity of San Diego. This was the type of Nuttall's genus *Rafinesquia*.

Sonchus fallax californicus Nutt. = *Sonchus asper* L. presumably. It is not, however, cited by Gray in the Synoptical Flora. Collected around San Diego.

Sonchus tenuifolius Nutt. = *Sonchus tenerrimus* L. In shady ravines about San Diego, among rocks.

Uropappus grandiflorus Nutt. = *Microseris linearifolia* (DC.) Gray. Collected by Nuttall at Santa Barbara also.

Uropappus heterocarpus Nutt. = *Microseris lindleyi* (DC.) Gray.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THREE NEW BATS FROM THE ISLAND OF CURAÇAO.*

BY GERRIT S. MILLER, JR.

Mr. Leon J. Guthrie, United States Weather Observer at Willemstad, Curaçao, West Indies, has obtained for the United States National Museum a small collection of bats preserved in formalin. Though representing only a fraction of the probable bat fauna of the island, the three species taken are of special interest, as all are new, while one is a member of a genus not hitherto detected outside of Mexico.

Myotis nesopolus sp. nov.

Type adult male (skin and skull from specimen in formalin) No. 101,849, United States National Museum, collected near Willemstad, Curaçao, West Indies, November 4, 1899.†

Character.—Similar to *Myotis nigricans* (Wied) from Colombia, but paler in color, and slightly smaller.

Color.—Dorsal surface intermediate between the raw umber and Prouts brown of Ridgway (Nomenclature of Colors, Pl. III, Nos. 11 and 14), the bases of the hairs just perceptibly darker. Ventral surface ochraceous buff, the basal half of the hairs slaty black.

Skull.—The skull exactly resembles that of *Myotis nigricans* from Santa Marta, Colombia and Chiapas, Mexico.

Measurements.—External measurements of type: total length, 70; tail vertebræ, 36; tibia, 15; foot, 5.6; forearm, 31; thumb, 4; longest finger,

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†"Caught by Mr. L. B. Smith in an attic in Punda." Collector's note.

55; ear from meatus, 11.6; ear from crown, 10; width of ear, 10; tragus, 6.8. Cranial measurements of type: greatest length, 13; basal length, 12; basilar length (median), 10; zygomatic breadth, 8; interorbital breadth, 3.2; mastoid breadth, 7; occipital depth, 5; mandible, 9; maxillary toothrow (exclusive of incisors), 5; mandibular toothrow (exclusive of incisors), 5.4.

Specimens examined.—One, the type.

Remarks.—*Myotis nesopolus* is readily distinguishable from *M. nigricans* by its much lighter color, especially on the underparts. Its color suggests that of dull specimens of *M. californicus* though the latter may always be recognized by the conspicuously bicolor fur of the back.

Glossophaga elongata sp. nov.

Type adult female (skin and skull from specimen in formalin) No. 101,871 United States National Museum, collected at Willemstad, Curaçao, West Indies, December 4, 1899.

Characters.—In appearance similar to *Glossophaga longirostris* Miller* from the Santa Marta Mountains, Colombia, but paler in color. Skull narrower and relatively much more elongate than that of the Columbian species. Incisors well developed, nearly double as large as in *G. soricina*,† the upper very strongly projecting forward.

Ears.—The ears are moderately long, laid forward they extend about half way from eye to tip of muzzle. Anterior border of conch strongly convex at base, then very gently convex to rather broadly rounded tip. Posterior border straight to middle, then slightly and evenly convex to faint notch marking boundary of very narrow and rudimentary unthickened antitragus. The posterior border terminates slightly in front of anterior border and 6 mm. behind angle of mouth. Both surfaces of ear smooth, the inner, however, with six or seven small but distinct cross ridges near posterior border, and a few inconspicuous scattered hairs. Tragus upright, acutely pointed, sometimes deeply notched at tip. Anterior border perceptibly thickened, nearly straight, slightly convex above. Point acute. Posterior border irregularly convex, occasionally so narrowly and deeply notched above that the tip appears bifid. Opposite anterior base there is a broad shallow notch, and below this the posterior border is more abruptly convex to base.

Muzzle and chin.—Lower, oval, portion of noseleaf small and very indistinctly outlined, but not peculiar in form. Terminal, erect, portion well developed, its width nearly equal to outer border. Tip rather bluntly rounded. Outer border slightly concave. Chin divided by a rather broad and shallow V-shaped groove, the edges of which are irregularly tuberculate.

Membranes.—The membranes are ample and somewhat thin, their surfaces rough. Width of uropatagium equal to length of tibia. Propatagium including metacarpal of thumb. The membranes are practically naked throughout.

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*Proc. Acad. Nat. Sci., Philadelphia, 1898, p. 330.

†In the type and only known specimen of *G. longirostris* the incisors are absent and their alveoli nearly resorbed.

Feet.—The foot is long and strong, about two thirds length of tibia. Toes essentially equal in length and distinctly longer than metatarsals. Claws large, nearly one half as long as rest of foot. Calcar distinct, 5 mm. in length, its extreme tip projecting beyond membrane.

Tail.—The tail is very short, about equal to calcar, its tip forming a minute projection on upper side of membrane.*

Fur and color.—The fur is very soft, but rather loose in texture. Length at middle of back about 5 mm. It is closely confined to body, reaching membranes in a very narrow line only. On humerus it extends about to middle both above and below. That of head covers basal third of outer surface of ears.

Color of dorsal surface hair brown irregularly lightened by appearance at surface of the pale drab which occupies the basal two thirds of the fur. This drab is paler than the ecru drab of Ridgway, but is distinctly tinged with yellowish brown. Underparts pale Isabella color, fading to ecru drab on flanks and washed with hair brown on chin, throat and chest, the hairs everywhere pale drab at base. Ears, feet and membranes dark brown.

Skull.—The skull of *Glossophaga elongata* is narrower and more elongate than that of *G. longirostris* and the braincase is smaller and less elevated above the faceline. The braincase rises above dorsal surface of rostrum at an angle of about 20° in *G. elongata* and *G. soricina*, but of scarcely 12° in *G. longirostris*. Rostrum slightly longer than in *G. longirostris*, and distinctly shallower when viewed from the side, its dorsal surface much more flattened, especially between orbits. Anterior nares narrower and more elongate. Rudimentary vertical process of zygoma as in *G. longirostris* and smaller than in *G. soricina*. Bony palate behind plain of last molar even narrower than in *G. longirostris*. Base of braincase as in *G. longirostris*, though the audital bullæ are slightly smaller.

Teeth.—The teeth are as in *Glossophaga longirostris*, except that the incisors, absent in the Colombian species, are well developed, and relatively larger than in *G. soricina*. The upper incisors project so nearly horizontally that when skull is viewed from directly above the entire anterior face is visible.

Measurements.—External measurements of type: total length, 65: tail vertebra, 5; tibia, 15.8; foot, 11.4; calcar, 5.4; forearm, 40; thumb, 10: longest finger, 78; ear from meatus, 14.6; ear from crown, 9.6; width of ear, 11: height of noseleaf above edge of lip, 5.4; height of noseleaf behind, 3; greatest width of noseleaf, 4.

Cranial measurements of type: greatest length, 24.4; basal length, 22.2; basilar length, 20.4; zygomatic breadth, 9.8: interorbital breadth

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*In the original description of *Glossophaga longirostris* the tail is stated, on the authority of the collector (no trace of it can be seen in the dry specimen) to be 18 mm. in length. This measurement without doubt refers to width of uropatagium.

(behind prominences), 5; mastoid breadth, 9.6; breadth of braincase above roots of zygomata, 9; depth of rostrum between orbits, 3; mandible, 16.2; upper toothrow (exclusive of incisors), 8.8; lower toothrow (exclusive of incisors), 9.

Remarks.—*Glossophaga elongata* differs conspicuously from *G. longirostris* in its paler color, particularly on the ventral surface. The cranial characters are equally distinctive. In one specimen (No. 101,855) the third upper molar is absent on both sides.

Leptonycteris curasoæ sp. nov.

Type adult male (in alcohol) No. 101,851 United States National Museum, collected at Curaçao, West Indies.

Characters.—Closely related to the Mexican *Leptonycteris nivalis* (Saussure) but color darker, and interfemoral membrane narrower and less hairy. *Upper incisors equally spaced* and more projecting than in the Mexican species. Second lower premolar slightly but distinctly crescentic.

Ears.—The ears are broad and short, laid forward they extend to anterior canthus of eye. Anterior border of conch nearly straight and almost horizontal through proximal 5 mm., then very abruptly convex. Beyond this convexity it is again straight for about 5 mm. below rather narrowly rounded tip. The two straight areas are nearly perpendicular to each other. Posterior border slightly concave below tip, then moderately convex to faintly marked notch at upper edge of antitragus. Antitragus small and ill defined, its substance distinctly thickened. The slightly concave anterior border terminates abruptly a little in advance of anterior base of ear, and 7 mm. behind angle of mouth. Outer surface of ear smooth and naked except at extreme base, where it is covered with fur similar to that of head. Inner surface slightly papillose and sprinkled with inconspicuous hairs. Four or five very indistinct cross ridges on inner surface of conch near middle of posterior border. Tragus upright, much thickened along anterior border. Anterior border straight to slight subterminal concavity. Point blunt. Posterior border irregular, but without distinct projections. Through anterior base the width of tragus is equal to one half anterior border.

Muzzle and chin.—Noseleaf diamond shaped, the lower portion bounded by the oblique nostrils, the upper and slightly larger portion erect and free. Lips below and at sides of nostrils tumid, this swollen area extending back on each side immediately behind noseleaf nearly to median line and separated posteriorly from noseleaf by a distinct, broadly V-shaped groove.

Chin divided by a deep groove, narrow below, wide above, its edges irregularly tuberculate.

Membranes.—The membranes are thick rough and leathery; the wings and propatagium broad and ample; the uropatagium greatly reduced (only 4 mm. wide at middle). Propatagium extending as a broad fold along forearm to include metacarpal of thumb. The membranes are essentially naked.

Feet.—The feet are large and strong, about two thirds length of tibia. Toes essentially equal in length, slightly longer than metacarpals, armed with large strong claws, the latter equal to about one third of rest of foot. Calcar distinct, 6 mm. in length.

Fur and color.—The fur is short, dense and velvety, that on middle of back about 4 mm. in length. It is closely confined to body, reaching membranes in a very narrow line only. On humerus it extends over proximal half both above and below. Dorsal surface of forearm densely but inconspicuously furred. Under surface of forearm and of propatagium and both sides of uropatagium scantly haired.

Color after three months immersion in formalin hair brown with a faint bluish cast, slightly paler on ventral surface, the hairs everywhere ecru drab at base. Ears and membranes dark brown.

Skull.—The skull is slightly larger than that of *Leptonycteris nivalis*, and the rostrum is a little deeper, but otherwise I can detect no cranial characters to separate the two species.

Teeth.—Upper incisors large and evenly spaced, not in two pairs separated by a distinct median gap as in *L. nivalis*. These teeth project so strongly forward that the entire anterior face is visible when skull is viewed directly from above. Maxillary teeth essentially as in *L. nivalis*. Lower incisors larger than in *L. nivalis* the lateral pairs less widely separated. Second lower premolar distinctly crescentic when viewed from its apex, the concavity directed inward. In *L. nivalis* this tooth is straight. Mandibular molars not peculiar.

Measurements.—External measurements of type: head and body, 70 (75)*; tibia, 20 (22); foot, 15 (14.6); foot without claws, 12.8 (12); calcar, 6 (6); forearm, 53 (55); thumb, 10 (11); longest finger, 96 (98); ear from meatus, 15.6 (16); ear from crown, 11.6 (12.8); width of ear, 12 (11); tragus, 6 (6.2); height of noseleaf posteriorly, 3 (3); greatest width of noseleaf, 3.4 (4).

Cranial measurements of type: greatest length, 26 (27); basal length, 25 (25.6); basilar length, 22.4 (23.6); zygomatic breadth, 11 (11); interorbital breadth, 5 (5); mastoid breadth, 10.6 (10.8); breadth of braincase above roots of zygomata, 10 (10); greatest depth of braincase, 8 (8); depth of rostrum between orbits, 3.2 (4); mandible, 17.4 (17.4); upper toothrow (exclusive of incisors), 9 (8.6); lower toothrow (exclusive of incisors), 9.9 (9).

Remarks.—The most prominent character of this species is the regular spacing of the upper incisors. The color is darker than that of the Mexican animal, in which the peculiar bluish cast is quite absent. In *L. nivalis* the legs and interfemoral membrane are noticeably sprinkled with hairs 5 mm. in length which produce a distinctly shaggy appearance. These hairs are reduced to an inconspicuous pubescense in *L. curasoæ*.

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*Measurements in parenthesis are those of an adult male *Leptonycteris nivalis* from Colima, Mexico.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

EIGHT NEW SPECIES OF NORTH AMERICAN PLANTS.*

BY CHARLES LOUIS POLLARD.

Lupinus psoraleoides n. sp.

Perennial, 1-1½ dm. high, subacaulescent, with a multicipital caudex and slender woody root; whole plant densely villous with long white hairs; leaves long-petioled, the blades 5-7-foliolate; leaflets oblanceolate, somewhat acute at the apex, 2-3 cm. long; spike very densely flowered, almost sessile, scarcely surpassing the foliage; flowers violet purple, 1 cm. long, subtended by narrowly linear scarious bracts; calyx one-half the length of the corolla, markedly bilabiate, the teeth acute; standard suberect, shorter than the keel; legume oblong, 1½ cm. long, tipped with the slender persistent style; seeds few, apparently nearly orbicular.

Type in the U. S. National Herbarium, No. 201,582, collected in open gravelly soil at Gunnison, Colorado, by Elam Bartholomew, August 30, 1899 (No. 2680). In aspect the plant suggests certain species of Psoralea; its marked peculiarities are the slender nearly sessile spike, the small standard and the long villous pubescence.

Viola amorphophylla n. sp.

Plant acaulescent, about 1 dm. high, from a stout, vertical rootstock, absolutely glabrous throughout and semisucculent; blades of the leaves elliptical or oblong-elliptical, the margins entire or sometimes obscurely crenate near the very obtuse apex, rarely with a small lobe or incision near the rounded or slightly tapering base; petioles narrowly margined, equalling the blades or shorter; stipules scarious, elongated-linear; scapes surpassing the foliage; flower purple, about 2½ cm. broad; sepals ovate-lanceolate, acute, auriculate at base; petals oblong, bearded, the spur short and blunt; capsule prismatic, one-third longer than the calyx; apetalous flowers borne on evidently erect scapes.

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Type in the U. S. National Herbarium, No. 209,214, collected at Tryon, North Carolina, May 5, 1897, and communicated by Mr. C. D. Beadle, Curator of the Biltmore Herbarium. A violet with very peculiar and anomalous foliage, showing affinities to the Sagittatae, but distinguished from all the species of that group by its oddly shaped leaves, large flowers and broad sepals.

Viola pruinosa. n. sp.

Plant low (about 1 dm. high), sending up numerous branching stems from a very short and thick rootstock; leaves slender-petioled, pinnately decompound, the ultimate divisions oblong-linear, 5-7 mm. long; under surface of the dull green foliage densely clothed with short and stiff, white, pruinose pubescence, so that the plant appears glaucous; petioles, especially those of the basal leaves, with broadly sheathing scarious margins; flowers solitary in the axils, borne on slender peduncles, rather small (1-1½ cm. broad); sepals linear, very short; petals narrowly oblong, beardless, bright yellow with purple veinings, the two uppermost petals often entirely overcast with purple; spur wanting; capsule not observed.

Type in the U. S. National Herbarium, No. 342,196, collected by John B. Leiberg in Bear Valley, California, at an altitude of 2200 meters, April 17, 1898 (No. 3307). Related to *V. Douglasii*, but at once distinguishable on account of the small flowers and the peculiar frosted appearance of the foliage.

Gentiana citrina n. sp.

Annual; stem simple, strict, 2-4 dm. high; leaves about six pairs, oblong or ovate-oblong, sessile or slightly clasping; inflorescence narrowly paniculate, the branches 1-5-flowered, each cluster subtended by a pair of foliaceous bracts; flower 1½-2 cm. long, yellow; calyx campanulate; the ovate-lanceolate, somewhat unequal lobes longer than its tube; corolla tubular-campanulate, with 4 or rarely 5 erect ovate lobes, one-fourth the length of the tube, quite destitute of sinus-appendages; throat crowned with a copious fringe of setae; capsule sessile.

Type in U. S. National Herbarium, No. 22,087, collected by C. G. Pringle in the valley of Toluca, State of Mexico, August 18, 1892 (No. 4196) and distributed as *G. Wrightii* A. Gray, from which it differs in certain important particulars. In his description of *Wrightii* Dr. Gray emphasizes the fact that the leaves nearly equal the internodes; the calyx lobes are said to have scabrous margins and the corolla is campanulate-funnel-form with lobes fully one-third the length of the tube. I have also examined the type of *G. Wrightii*, which was collected in southern Arizona, and find little in common between the two species except the characters of the subgenus to which both belong. Mr. Pringle's No. 4237, also from Toluca, collected at an altitude of 11,000 feet, is evidently a depauperate alpine form of *G. citrina*.

Gentiana connectens n. sp.

Stem slender, rather lax, 4-6 dm. high, with scattered branches; leaves oblanceolate, the uppermost smaller, linear-lanceolate; flowers 1-3 at the ends of the branches, borne on slender filiform pedicels of twice or even thrice their length; calyx narrowly campanulate, 1 cm. long, its tube very short, its lobes linear-acuminate; corolla twice the length of the calyx, violet-purple, with 5 erect ovate-lanceolate lobes destitute of sinus-plaits; throat crowned with numerous filiform setae; anthers versatile; ovary markedly stipitate; stigmas 2, coherent at base; capsule with numerous oblong brown seeds.

Type in U. S. National Herbarium, No. 22,045, collected by Thomas Bridges in California (No. 166a). No more specific locality than this appears on any of Bridges' labels. The name assigned to this gentain refers to the fact that it combines certain characters of the two main subgeneric groups; thus it possesses the crown of setae, stipitate ovary and absence of corolla-glands indicative of Gentianella; but the lobes of the corolla are five in number, as in Pneumonanthe, which it also suggests in habit.

Gentiana decora n. sp.

Stem simple, or with one or two short branches above, 3 dm. or more high, sparsely and minutely puberulent; leaves lanceolate or the lower oblanceolate, tapering to base and apex, slightly petioled, the margins not ciliate; flowers sessile, in a terminal bracted cluster of five or more, a few often scattered in the upper axils; calyx-tube cylindrical, puberulent, 8-10 mm. long, more than twice the length of the widely separated narrowly linear and ciliate-margined lobes; corolla campanulate-funnelform, 2½-3 cm. long, bright blue with darker stripes, within paler and the stripes more conspicuous; lobes of the corolla ovate, slightly mucronate, scarcely twice the length of the unequally bidentate sinus-appendages; seeds and other floral characters as in *G. Elliottii.*

Type in the herbarium of Columbia University, collected by Mr. A. M. Huger near Waynesville, N. C., September and October, 1896. Specimens of this and other southern gentians were very kindly sent to me for determination by Dr. John K. Small. The species is very nearly related to *G. Elliottii*, but differs in the more acute corolla-lobes, the absence of fimbriation on the sinus-plaits of the corolla, and the short, narrow calyx-lobes.

Chrysopsis latisquamea n. sp.

Perennial by offshoots, erect, 4-5 dm. high, the foliage and lower portion of the stem clothed with a loose white arachnoid tomentum; basal leaves rosulate, oblanceolate or spatulate, obtuse, the margins entire; stem leaves sessile, linear or linear-oblong, the upper becoming small and bract-like; inflorescence cymose, the branches glandular-pubescent, each terminated by a single large head 1½ cm. high; involucre broadly campanulate; bracts ovate-lanceolate, more or less herbaceous,, glandular, the innermost longest; rays bright yellow, linear, 1 cm. long; pappus copious, yellowish-white, the outer series of bristles very short and capillary, the inner minutely setulose; achene 2 mm. long, fusiform, slightly compressed, villous, with 8-10 salient longitudinal ribs; receptacle strongly alveolate.

Type in U. S. National Herbarium, collected by Miss Marie Meislahn at Clarcona, Florida, (No. 150), and communicated by Mr. A. J. Pieters, who has kindly placed in my hands for determination a large collection of Florida plants. This Chrysopsis differs from *C. pilosa* (Walt.) Britton (*C. gossypina* Nutt.) to which it is most nearly related, by the broad involucral bracts and many-ribbed achenes. Its involucre is so strikingly peculiar for his genus that were it not for the similarity of other structural characters the plant might be considered a distinct generic type.

Solidago Maxoni n. sp.

Slender, erect, ½-1 m. high, the stem striate-grooved and glandular-pubescent, particularly above; leaves 5-7 cm. in length, thin, 1-nerved, slightly glandular-pubescent above, pale and glabrous beneath, the margins entire or exhibiting an occasional serration, lanceolate in outline, acute or acuminate at apex, tapering at base to a short margined petiole; lowermost leaves similar in shape, but slender-petioled; uppermost smaller and linear-lanceolate; inflorescence thyrsoid-paniculate, elongated, 2-3 dm. long, the branches numerous, each bearing from 3 to 12 slender-pedicelled heads, the pedicels and branchlets densely strigose-pubescent; heads small (5-7 mm. high) the involucre campanulate, with numerous loosely imbricated herbaceous or somewhat scarious obtuse and ciliate-margined bracts; rays about one-half the length of the inner bracts; achene linear, laterally compressed, glabrous.

Type in the U. S. National Herbarium, No. 357,109, collected on Bald Knob, Salt Pond Mountain, Virginia, by Charles L. Pollard and William R. Maxon, August 25, 1899 (No. 71). This Solidago is related to *S. monticola*, of which typical specimens were secured from the same region. The marked glandular pubescence, nearly entire leaves and different type of inflorescence are characters which have warranted its separation. I have taken pleasure in naming it for my companion and associate, Mr. Maxon.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

SOME NEW OR NOTEWORTHY LOUISIANA PLANTS.*

BY CHARLES LOUIS POLLARD AND CARLETON R. BALL.

The species described below were collected by Mr. Ball in the vicinity of Alexandria, Louisiana, during the summer of 1899. A report on the entire collection is in preparation by Mr. Ball, who has kindly afforded me an opportunity of examining with him the more interesting portions of his material.

C. L. P.

Baptisia Texana (Holzinger), n. comb.

Baptisia lanceolata texana Holzinger, Contr. U. S. Nat. Herb. 1:286. Oct. 31, 1893.

Plant erect, 5-6 dm. high, the stems freely branching, pubescent; leaves subcoriaceous, nearly sessile, mostly shorter than the internodes; leaflets oblong or obovate, very obtuse at apex, cuneate at base, slightly petiolulate, 3-4 cm. long, both surfaces strongly reticulate veined and sprinkled with scattered hairs; flowers solitary in the upper axils, and also forming short terminal racemes, yellow, 2 cm. long; calyx hirsute, with 5 short teeth; corolla resembling that of *B. lanceolata;* legume ovoid, stipitate, villous, 1-1½ cm. long, tipped with the elongated persistent style; seeds few, ovoid, 3-4 mm. long.

Mr. Holzinger based his variety on Nealley's No. 73, from Texas, the type being in the U. S. National Herbarium. In the course of his description he remarks "The pubescence, including the ovary, the sessile leaves, and the nearly sessile solitary flowers in the axils of the upper leaves of the flowering branches, which are terminated by few-flowered racemes, associate this plant closely with *Baptisia lanceolata*". A very superficial examination of the characters involved would have convinced Mr. Holzinger that he was in error, even if he had chosen to regard the principles of geographic distribution as of no consequence. *Baptisia lanceolata* is a plant of the southeastern Atlantic coast from South Carolina to Florida, and is not known from the Gulf states. Its leaves are by no means sessile, but distinctly petiolate, the petioles in many cases a centimeter or more in length, while the leaflets, instead of being short and obovote as in *B. Texana*, are elongated, and unmistakably lanceolate in outline. The stems, moreover are glabrous in *lanceolata*. The nearest ally of *B. Texana* is probably *B. laevicaulis*, a species which is glabrous throughout, however, even to the pod. Excellent fruiting specimens were obtained by Mr. Ball near Alexandria, La., June 3, 1899 (No. 546), growing on hillsides under scrub oaks.

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Stylosanthes biflora hispidissima (Michx), n. comb.

Stylosanthes hispida var. *b. hispidissima* Michx., Fl. Bor. Am. 1:75 1803.

This form differs from the type in the long hirsute pubescence with which the stem and often the foliage is clothed. Michaux's characterization of the variety as "universe hispidissima" leaves little doubt as to its identity. The plant is more prostrate in habit and diffusely branched than the ordinary form of *S. biflora*. Mr. Ball's specimens were collected at Alexandria, La., June 10, 1899 (No. 621).

Prunella vulgaris scaberrima n. var.

Stems purple; herbage and inflorescence densely hispid and scabrous-pubescent with white hairs; otherwise similar to *P. vulgaris*.

Type in U. S. National Herbarium, collected by Mr. Ball at Alexandria, La., June 9, 1899 (No. 607). The plant is there common in dry soil.

Physalis rigida n. sp.

Perennial, from a thick root; stems tufted, erect, rigid, sulcate, more or less branching, 3-3½ dm. high, hispid-pubescent with flat hairs, particularly above; leaves firm, ovate-lanceolate, obscurely repand-dentate, acute at apex, tapering to base, densely pubescent when young, scabrous above when mature, 4-6 cm. wide; petioles slender, 1½-4 cm long; flowers small, 1-1½ cm. broad, on slender hispid-pubescent pedicels; flowering calyx densely pubescent, its lobes ovate-triangular, acute; limb of corolla yellow, the throat dark purple; fruiting calyx nearly smooth, ovoid, obscurely 10-ribbed, 2½-3 cm. long, truncate or somewhat depressed at base; pedicel reflexed, hispid-pubescent, about 2 cm. long.

Type in the U. S. National Herbarium, collected at Alexandria, La., on a dry railroad embankment May 23, 1899 by Mr. Ball (No. 431). No. 435, a fruiting specimen, is to be referred here. The plants were submitted to Dr. P. A. Rydberg for determination, who writes as follows concerning them:

"The two specimens of Physalis sent me belong to an undescribed species. It is nearest related to *P. virginiana intermedia* Rydberg. * * The new species differs from *intermedia* in the thicker and broader leaves, the fruiting calyx, which is angled and more rounded at the base, and in the lack of viscid pubescence. It may also be compared with *P. longifolia*, but has much shorter and broader leaves and is more puberulent. I would be glad to have you describe it as I have very little time and pay no attention to any other botany at present except the flora of the Rocky Mountain region."

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PROCEEDINGS

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SEVEN NEW RATS COLLECTED BY DR. W. L. ABBOTT IN SIAM.*

BY GERRIT S. MILLER, JR.

Among the mammals collected by Dr. W. L. Abbott during a second expedition to Siam, and presented to the United States National Museum are seven large and medium sized species of *Mus*, all of which appear to be new. They were secured in the mountains of Trong, a small state subject to Siam and situated on the west side of the Malay Peninsula about 500 miles north of Singapore.

KEY TO THE RATS OF TRONG.†

- **Hind foot about 50 mm.; skull about 55 mm.**
  - Tail much longer than head and body; back and sides strongly ochraceous............................... *Mus vociferans.*
  - Tail about equal to head and body; back and sides not ochraceous.
    - Fur composed almost exclusively of fine, grooved bristles; ear longer than broad; general color above iron gray, beneath dull white.......... *Mus ferreocanus.*
    - Fur composed almost exclusively of coarse hairs, with a very few slender grooved bristles intermixed; ear as broad as long; general color grizzled brown above, pale buff below...... .... *Mus validus.*

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†Exclusive of *Mus* '*alexandrinus.*'

Hind foot less than 40 mm.; skull less than 45 mm.

Tail much longer than head and body, dark brown throughout.......................................*Mus cremoriventer.*

Tail about equal to head and body, bicolor.

Tail slightly shorter than head and body; hind foot less than 30 mm.; fur of belly dusky at base......*Mus asper.*

Tail equal to or slightly longer than head and body; hind foot more than 30 mm.; fur of belly not dusky at base.

Nasals extending conspicuously behind nasal branches of premaxillaries; white of belly broadly continuous over lower leg with that of foot; general color dull ochraceous.........*Mus pellax.*

Nasals not extending behind nasal branches of premaxillaries; white of belly usually separated from that of foot by tawny inner surface of lower leg; general color bright ochraceous..*Mus surifer.*

Mus vociferans sp. nov.

Type adult male (skin and skull) No. 86,736 United States National Museum, collected in the mountains of Trong, Lower Siam, at about 1000 ft. altitude, February 21, 1899.

Characters.—Similar to *Mus sabanus* Thomas of Borneo, but generasize slightly greater and color apparently paler and brighter. Antorbital foramen less constricted below than in *M. sabanus* and with much wider outer wall. Region about posterior extremity of nasals less elevated. Molars relatively larger than in *Mus sabanus.*

Fur.—The fur is composed of three elements: (a) fine, somewhat wooly underfur, plumbeous on the back, white on the belly, (b) coarse terete hairs, and (c) grooved hairs or slender bristles. These all pass by in sensible gradations from one kind to another. On back the hairs and bristles are about 15 mm. in length. Those of rump are not elongated. On belly they are much shorter, scarcely exceeding 6 mm. Inner surface of legs free from bristles.

Color.—Back and sides ochraceous, everywhere sprinkled with black. The ground color is brightest on back and rump where it approaches orange ochraceous, and dullest on sides where it is very nearly raw sienna. The black is most conspicuous over lumbar region where it is somewhat in excess of the ochraceous. Further forward the two colors are about equally mixed. On sides the black is very inconspicuous. Top of head like back, but colors more finely mingled. Cheeks orange buff, very slightly sprinkled with buff posteriorly. Muzzle dull hair brown. Whiskers black. Belly and inner side of legs dull yellowish white to base of hairs; elsewhere the underfur is slate gray. Feet white, irregularly clouded with hair brown. Tail bicolor at base (dark brown above, whitish below) whitish throughout beyond middle.

Tail.—The long slender tail of *Mus vociferans* is coarsely, conspicuously, and uniformly annulated. At middle there are only seven or eight rings to the centimeter. The rings are irregularly and inconspicuously marked by cross furrows dividing them into sharply rectangular scales longer than broad. Numerous stiff hairs spring from beneath the free edges of the rings, usually three to each scale. In length they scarcely exceed width of the rings, except near tip where they become longer and less stiff.

Skull.—The skull of ***Mus vociferans*** (Pls. III and IV, Fig. 3) is large, but in proportion to its size not very heavily built. In general appearance it differs only slightly from that of ***M. sabanus***. On comparison it is seen to differ from that of the Bornean species in less robust rostrum, less elevated frontal region between roots of zygomata, and in the form of the antorbital foramen. This is smaller and more contracted, especially below, and the maxillary plate forming the outer wall is wider and less concave. The front edge of this plate is nearly straight, though slightly convex above. The audital bullæ like those of ***Mus sabanus*** are relatively very small, scarcely more than half as large as in ***Mus decumanus***. By this character alone the species may be distinguished from the other large rats of the Malay Peninsula.

Teeth.—The teeth appear to agree in all respects with those of ***Mus sabanus***, though I have seen none of the latter unworn. The enamel pattern is like that of ***M. decumanus*** except that there is no trace of rudimentary anterior outer tubercle often present in the second upper molar of the houserat. As in this species the posterior upper molar consists of an anterior inner tubercle followed by a crescentic loop with concavity directed inward. In unworn teeth this loop is normally complete, though in some specimens the posterior limb is divided by a furrow. With abrasion the limbs of the crescent become separated. Front surface of incisors deep orange.

Measurements.—External measurements of type: total length, 611; head and body, 229; tail vertebræ, 382; hind foot, 45 (43)*; ear from meatus, 24; ear from crown, 19; width of ear, 18. Seven specimens (including type): total length, 566 (545-611); head and body, 224 (216-229); tail vertebræ, 342 (323-380); hind foot, 45 (42-48); hind foot without claw, 43 (40-46).

Cranial measurements of type: greatest length, 56; basal length, 47.6; basilar length, 44.6; palatal length, 25; least width of palate between anterior molars, 5; diastema, 14.8; length of incisive foramen, 8; combined breadth of incisive foramina, 3.8; length of nasals, 21.4; combined breadth of nasals, 6.2; zygomatic breadth, 25.8; interorbital breadth, 9; breadth of braincase above roots of zygomata, 20.4; mastoid breadth, 18.8; occipital depth at front of basioccipital, 14; frontopalatal depth at posterior extremity of nasals, 13.6; least depth of rostrum immediately behind incisors, 11; maxillary toothrow (alveoli), 11.8; width of front upper molar, 3; mandible, 30.6; mandibular toothrow (alveoli), 10.

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*Measurement of hind foot in parenthesis is taken exclusive of claws.

Specimens examined.—Eight, all taken at or near the type locality.

Remarks.—*Mus vociferans* is the mainland representative of *M. sabanus*, a rat quite unlike any of the other species known to occur on the Malay Peninsula, and at present recorded from Borneo and the Natuna Islands only. It is a very noisy animal; when trapped its loud cries so quickly attract the smaller carnivores that perfect specimens are with difficulty obtained.

Mus ferreocanus sp. nov.

Type adult female (skin and skull) No. 86,737 United States National Museum, collected in the mountains of Trong, Lower Siam, at about 3000 ft. altitude, January 15, 1899.

Characters.—Size large (hind foot about 56; greatest length of skull, 53) tail slightly longer than head and body, dark brown at base, whitish at tip; ear long and narrow, its length greater than distance from eye to nostril; fur composed almost exclusively of fine grooved bristles; general color above bluish iron gray, beneath pure white; skull with slightly developed supraorbital ridges.

Fur.—Underfur rather scant, not at all woolly except on belly. The main body of the fur is composed of fine grooved bristles, those on middle of back about 15 mm. in length. Interspersed with the bristles are a few terete black hairs, 25-30 mm. in length. These are practically confined to the back and rump, and are nowhere conspicuous.

Color.—The color of this rat is difficult to describe with accuracy, as the tints cannot be matched in Ridgway's Manual of Colors. The general effect is a lustrous bluish iron gray, darker along middle of back, paler and slightly drab-tinged on sides; everywhere frosted by the pale glistening tips of the bristles, which produce a sheen varying much with different exposures to light. Cheeks washed with drab gray, muzzle with seal brown. Underparts creamy white, this color extending down inner side of front legs to wrists, and on hind legs nearly to ankles. Fur of dorsal surface gray (Ridgway, Pl. II, No. 8) at base, that of underparts white throughout. Ear dark brown; a small tuft of fine white hairs immediately beneath orifice. Tail dark brown, the terminal fourth dull white. Hind feet uniform sepia. Front feet sepia varied with dull white.

Tail.—The moderately long tail of this species is finely, inconspicuously and somewhat irregularly annulated. At middle there are twelve rings to the centimeter. The rings are divided by cross furrows into scales longer than broad and with rounded corners. These scales, however, are scarcely noticeable to the unaided eye. The fine stiff hairs that spring from the spaces between the rings are in length about one half greater than width of ring, and are apparently not definitely arranged with regard to the scales. Near tip of tail the rings become narrower and more indefinite and the hairs longer and less stiff, though without forming any semblance of a pencil.

Skull.—The skull of *Mus ferreocanus* (Pls. III and IV, Fig. 2) though of the same general size as that of the other large rats of Trong, is easily recognizable by its shallow, weak rostrum and tapering form as well as by various details in structure. The zygomata are strongly convergent anteriorly, their anterior roots relatively light and little spreading. Antiorbital foramina small, but less contracted below than in the other species. The plate forming its outer wall is faintly concave on the outer surface, its anterior border slightly convex from below middle, the straight portion at base *sloping distinctly backward.* Pterygoids long and straight to the extreme tip, the interpterygoid space *narrowing gradually and continuously* from behind forward. Audital bullæ much larger than in *Mus vociferans,* but not peculiar in form. Interorbital region narrow. Supraorbital ridges low and little developed, much as in *Mus bowersi,* but traceable along sides of braincase to lambdoid ridge.

Teeth.—Molars slightly narrower than in *Mus vociferans,* the enamel folds relatively broader, but not essentially different in form. The posterior limb of the terminal crescent in the third upper molar is normally divided from the anterior, even in unworn teeth. Lower molars differing in much the same manner as the upper. Incisors relatively weak, their anterior face *yellowish white.*

Measurements.—External measurements of type specimen: total length, 489; head and body, 238; tail vertebræ, 251; hind foot, 56 (53); ear from meatus, 27; ear from crown, 21; width of ear, 17. A second adult specimen: total length, 501; head and body, 241; tail vertebræ, 260; hind foot, 56 (53).

Cranial measurements of type: greatest length, 53.6; basal length 48; basilar length, 45; palatal length, 25; least width of palate between anterior molars, 5; diastema, 15.8; length of incisive foramen, 9.4; combined breadth of incisive foramina, 3.8; length of nasals, 22.6; combined breadth of nasals, 5.2; zygomatic breadth, 25.4; interorbital breadth, 8; mastoid breadth, 20.2; breadth of braincase above roots of zygomata, 20; depth of braincase at anterior extremity of basioccipital, 14.6; frontopalatal depth at posterior extremity of nasals, 12; least depth of rostrum immediately behind incisors, 8; maxillary toothrow (alveoli), 9.4; width of front upper molar, 2.8; mandible, 30; mandibular toothrow (alveoli), 9.

Specimens examined.—Three, all from the type locality.

Remarks.—This species is not closely related to the other rats of the Malay Peninsula; and I am unable to find any description of an animal at all resembling it among the forms occurring in the East Indian Archipelago.

Mus validus sp. nov.

Type adult male (skin and skull) No. 86,741 United States National Museum, collected in the mountains of Trong, Lower Siam, at about 1000 ft. altitude, February 18, 1899.

Characters.—A large robust animal in size and general appearance resembling *Mus bowersi* Anderson from Burmah. Fur coarse, but essentially spineless. Tail about as long as head and body, dark brown throughout, its annulation more coarse that in *M. bowersi*. Ear short and broad, its length less than distance from eye to nostril. Skull and teeth much heavier than in the Burmese species, the rostrum shorter, broader and deeper, and supraorbital ridges remarkably heavy. *Enamel pattern of third upper molar essentially like that of second, and both with well developed antero-external tubercle.*

Fur.—Although the fur is composed of the usual three kinds of hair the bristles are so slender that to the unaided eye their true nature is not apparent. They average about 30 mm. in length on the back, while the terete hairs are little more than half as long.

Color.—Back and sides a fine grizzle of black and dull buff (slightly browner than Ridgway, Pl. V, No. 13), the two colors nearly equally mixed on back, but the black hairs much less abundant on sides, where the buff is somewhat dulled by the irregular appearance at the surface of the gray (Ridgway, Pl. II, No. 7) underfur. Underparts cream buff to base of hairs, this color extending down inner surface of legs to wrists and nearly to ankles. Feet scantily clothed with short sepia hairs. Head like back, but the colors more closely blended. Cheeks like sides. Muzzle hair brown. Ears and tail dark brown, the latter without trace of paler tip.

Tail.—The moderately long tail is coarsely conspicuous and uniformly annulated. At middle there are about 9½ rings to the centimeter. The rings are noticeably divided by cross furrows into scales slightly longer than broad, the distal edges of which are crenulate. Numerous stiff black hairs spring from beneath the free edges of the rings, usually three to each scale. In length the hairs about equal the width of the rings. At tip of tail the rings become closer and the hairs longer and less stiff but without forming a pencil.

Skull.—The skull of *Mus validus* (Pls. III and IV, Fig. 1) differs more widely from that of *M. bowersi* (Pls. III and IV, Fig. 4) than could be anticipated from the external similarity of the two animals.* The latter in fact bears a superficial resemblance to the skull of *Mus vociferans*, differing chiefly in its more slender rostrum, larger audital bullæ, more convergent zygomata, and obsolete supraorbital ridges, characters all but one of which are directly the opposite to those of *Mus validus*. Supraorbital ridges very prominent, and forming a distinct postorbital angle, behind which they are continued backward along sides of braincase to extremities of interparietal. The lower portion of the antorbital foramen, widely open in *Mus bowersi*, is here reduced to a mere slit, partly as the result of shortness of rostrum and consequent unusually close contiguity of root of incisor and anterior edge of outer wall of foramen. The plate forming this outer wall is broad, its outer surface distinctly concave. Anterior border strongly convex from a little below middle,

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*For the opportunity to examine a specimen of *Mus bowersi* collected by Fea at Yado, Burmah, I am indebted to Dr. R. Gestro, of the Genoa Museum.

the basal straight portion directed *slightly forward.* Audital bullæ smaller than in *Mus bowersi,* though nearly double as large as in *M. vociferans,* subcircular in outline when viewed from the side.

Teeth.—The teeth are broader than in the other large rats from Trong, but the toothrow as a whole is not correspondingly lengthened. Enamel pattern of first upper molar as in *Mus decumanus.* In the second tooth a small but distinct antero-external tubercle is added to the number normally present.* Occasionally this tubercle is connected with that of opposite side, so that the enamel pattern consists of three transverse folds as in the first tooth. Third molar like second, though smaller, and the elements of the tooth less distinct. This tooth is therefore of more complicated structure than that of *Mus decumanus,* owing to the addition of an anterior outer tubercle, and the normal division of the posterior crescent into two transverse loops.

Measurements.—External measurements of type: total length, 521; head and body, 254; tail vertebræ, 267; hind foot, 49 (46); ear from meatus, 20.6; ear from crown, 16; width of ear, 16. Another specimen, also a male: total length, 515; head and body, 248; tail vertebræ, 267; hind foot, 52 (49).

Cranial measurements of type: greatest length, 55; basal length, 48.6; basilar length, 45.6; palatal length, 26; least width of palate between anterior molars, 5; diastema, 14.6; length of incisive foramen, 9; combined breadth of incisive foramina, 3.6; length of nasals, 22.6; combined breadth of nasals, 6.2; zygomatic breadth, 28; interorbital breadth, 8; mastoid breadth, 19; breadth of braincase above roots of zygoma, 20; depth of braincase at anterior border of basioccipital, 15; fronto-palatal depth at posterior extremity of nasals, 13.4; least depth of rostrum immediately behind incisors, 10; maxillary toothrow (alveoli), 11; width of front upper molars, 3; mandible, 31; mandibular toothrow (alveoli), 10.

Specimens examined.—Two, both from the type locality.

Remarks.—Though this rat bears a strong superficial resemblance to *Mus bowersi* its skull and teeth show that there is no very close relationship between the two animals. Probably the Siamese animal is more nearly related to the Bornean *Mus infraluteus* Thomas. This species, which is slightly larger than *Mus validus,* and with actually as well as relatively shorter tail, differs from it further in darker general color, and in the dark underfur of the ventral surface. The skull is shorter and apparently broader, and the incisive foramina do not extend back to line of front of molars. The palate is said to be 32 mm. in length, while in *M. validus* it is only 26 mm. In the original description of *Mus infraluteus* the enamel pattern is not mentioned. It is therefore presumably normal and quite different from that of *M. validus.*

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*A trace of this tubercle is usually visible close to the cingulum in *Mus decumanus,* but forming no part of the triturating surface of the crown.

Mus cremoriventer sp. nov.

Type adult male (skin and skull) No. 86,770 United States National Museum, collected in the mountains of Trong, Lower Siam, at about 3000 ft. altitude, January 16, 1899.

Characters.—A slender animal about the size of *Mus jerdoni* Blyth, from Mount Mooleyit, Burmah. Tail much longer than head and body, *dark brown throughout, thinly but distinctly penicillate.* Fur very thickly spinous. General color dull ochraceous above, whitish cream buff beneath. Skull shorter and relatively broader than that of *M. jerdoni.*

Fur.—As in *Mus jerdoni* the fur of the back and sides is composed of three kinds of hair, (a) soft fine underfur about 10 mm. in length, light gray at base and ochraceous at tip, (b) broad, grooved bristles slightly longer than the underfur, light horn color at base, those on back blackish at tip, those on sides uniform throughout, and (c) slender terete hairs 20 mm. in length, blackish throughout, but darker at tip than at base. The long hairs are rather abundant on back, most numerous posteriorly. On sides they soon disappear. On belly the bristles and underfur alone are present, both much reduced in length, and without dark bases. Legs nearly free from bristles except on outer side.

Color.—General color above dull ochraceous fading to ochraceous buff or dull buff yellow on sides, the sides nearly clear, but back, shoulders, neck and head uniformly sprinkled with black-tipped hairs and bristles which are nowhere in excess of the ochraceous. Cheeks clear ochraceous buff. Muzzle hair brown, paler at the sides. A narrow dark shade encircles each eye but without forming a distinct eyering. Underparts and inner surface of legs clear light cream buff to base of hairs, sharply defined and extending to wrists and ankles. Feet mixed whitish and sepia. Tail and naked ears uniform dark brown throughout.

Tail.—The slender tail is conspicuously and regularly annulated. At middle there are 11 or 12 rings to the centimeter. The rings are sharply marked off from each other, and so slightly divided by cross furrows that to the unaided eye they appear entire. With a lens they are seen to be made up of rectangular scales slightly longer than broad. The free edges of the rings are slightly crenulate and from beneath them spring stiff black hairs whose length slightly exceeds width of rings. There are usually three hairs to each division of the ring. Toward tip the rings become much narrower and the hairs longer, forming a thin but evident pencil.

Skull.—The skull of *Mus cremoriventer* (Pl. V, Fig. 2) is shorter and broader than that of *M. jerdoni* (Pl. V, Fig. 1). Its reduction in length is due more to shortening of the rostrum than of the braincase, so that the form of the skull is sensibly altered. Incisive foramina shorter and relatively broader than in *Mus jerdoni*, their posterior extremity on level with front of first molar. Antorbital foramen smaller than in *Mus jerdoni* but less contracted below. The maxillary plate forming its outer wall is narrow, the greatest width only 2.8 mm. Its anterior border is faintly concave below and faintly convex above, the general slope uniformly backward. Zygomata light though less slender than in *M. jerdoni*, not abruptly flaring anteriorly. Supraorbital ridges well developed and continued backward to interparietal, but not forming a distinct postorbital angle.

Teeth.—The teeth agree closely with those of *Mus jerdoni*. Arrangement of molar tubercules as in *M. jerdoni* and *M. decumanus*. Anterior face of incisors bright orange, the upper somewhat darker than the lower.

Measurements.—External measurements of type: total length, 317; head and body, 146; tail vertebræ, 171; pencil, 8; hind foot, 30 (28.5)?;* ear from meatus, 17; ear from crown, 13; width of ear, 12. A second specimen: total length, 305; head and body, 130; tail vertebræ, 175; hind foot, 30 (28.5)?*

Cranial measurements of type: greatest length, 34; basal length, 28; basilar length, 25; palatal length, 13.4; least width of palate between anterior molars, 3.4; diastema, 8.2; length of incisive foramen, 5.6; combined breadth of incisive foramina, 2.6; length of nasals, 11.8; combined breadth of nasals, 4; zygomatic breadth, 15.4; interorbital breadth, 6; mastoid breadth, 12.8; breadth of braincase over roots of zygomata, 14.8; depth of braincase at front of basioccipital, 10; fronto-palatal depth at posterior extremity of nasals, 7; least depth of rostrum immediately behind incisors, 6; maxillary toothrow (alveoli), 6; width of front upper molar, 1.6; mandible, 15.6; mandibular toothrow (alveoli), 6.

Specimens examined.—Two, both from the type locality.

Remarks.—*Mus cremoriventer* differs too widely from the other species known to occur on the Malay Peninsula to require any special comparison. It is immediately recognizable by its moderate size, slender form, spiny fur, and long, unicolor, slightly penicillate tail.

Mus asper sp. nov.

Type adult female (skin and skull) No. 86,767 United States National Museum, collected in the mountains of Trong, Lower Siam, at an altitude of about 1000 ft., February 2, 1899.

Characters.—Smaller than *Mus jerdoni* (hind foot about 28 mm). Tail shorter than head and body, bicolor, but not white at tip. Fur of back very densely set with stiff bristles. General color raw sienna above, dull buff beneath, the *fur everywhere dusky at base*; a tawny spot on chest. Skull relatively broader than in *Mus jerdoni* or *M cremoriventer*, the anterior portion of the zygomata more abruptly flaring and *whole arch disproportionally heavy.*

Fur.—The fur is as in *Mus jerdoni* and *M. cremoriventer*, except that the spines are more abundant on back and less numerous on sides and belly. Back with very few long terete hairs. Legs wholly free from bristles.

Color.—General color above raw sienna (slightly paler than Ridgway, Pl. V, Fig. 2) fading to light ochraceous on sides. Back, shoulders, neck, and head uniformly clouded or speckled with bister; this and the raw sienna present in about equal quantities. Bister soon disappearing on sides and cheeks. Muzzle hair brown, grayish at sides. A dark shade about eye. Underparts dull buff, sharply defined, much darker and browner than in *M. cremoriventer*, fading to buffy gray on chin and inner side of legs, down which it extends to join dull white of feet. A small tawny spot on middle of chest. *Fur of underparts everywhere conspicuously dusky at base.*

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*Distorted in preparation; measurement probably too long.

Tail.—Except for its shortness the tail is essentially like that of *M. cremoriventer*. The annulation, however, is a little less distinct, and the rings are more noticeably divided by cross furrows. In none of the specimens is the tail perfect to extreme tip, but there is no apparent tendency to form a pencil.

Skull.—The skull of *Mus asper* (Pl. V, Fig. 3) while of about the same length as that of *Mus jerdoni* (Pl. V, Fig. 1) differs conspicuously in the deeper rostrum, strongly cuneate nasals, larger antorbital foramen, heavier, more abruptly flaring and more depressed zygomata, and larger, strongly angled supraorbital ridges. Incisive foramina short and broad, their outer margins convergent anteriorly. Interpterygoid space shorter and wider than in *Mus jerdoni.* Plate forming outer wall of antorbital foramen essentially as in *Mus cremoriventer*, and distinctly less convex above than in *Mus jerdoni.*

Teeth.—The teeth appear to be precisely like those of *Mus jerdoni.*

Measurements.—External measurements of type: total length, 254; head and body, 133; tail vertebræ, 121; hind foot, 27 (25.5); ear from meatus, 18; ear from crown, 13; width of ear, 14. An adult male from the type locality: total length, 235; head and body, 121; tail vertebræ, 114; hind foot, 28 (26.5). The hind foot in two specimens in alcohol measures respectively, 28.6 (27.4) and 26 (25).

Cranial measurements of type; greatest length, 34; basal length, 28; basilar length, 26; palatal length, 13.4; least width of palate between anterior molars, 3.6; diastema, 8.4; length of incisive foramen, 4.6; combined breadth of incisive foramina, 2.8; length of nasals, 11; combined breadth of nasals, 3.8; zygomatic breadth, 15.4; interorbital breadth, 5.8; mastoid breadth, 11.8; breadth of braincase above roots of zygomata, 13.6; depth of braincase at front of basioccipital, 9.8: frontopalatal depth at posterior extremity of nasals, 8; least depth immediately behind incisors, 6; maxillary toothrow (alveoli), 6; width of first upper molar, 1.4; mandible, 17.2; mandibular toothrow (alveoli), 5.4.

Specimens examined.—Six (two in alcohol), all from the type locality.

Remarks.—While *Mus asper* differs widely from the known mainland representatives of the genus it is probably rather closely related to the Bornean *Mus whiteheadi* Thomas, a species which I know by description only. *Mus asper* agrees with the Bornean animal in size, character of fur, color scheme, and general aspect of skull, but differs from it in its shorter tail, lighter color with stronger contrast between sides and belly, less developed maxillary plate forming outer wall of antorbital foramen; relatively wider incisive foramina, and apparently longer molar row.

Mus pellax sp. nov.

Type adult female (skin and skull) No. 86,755 United States National Museum, collected in the mountains of Trong, Lower Siam, at an altitude of about 1000 ft., February 5, 1899.

Characters.—Closely related to *Mus jerdoni* Blyth from Mount Mooleyit, Burmah, but with larger skull and teeth, much shorter incisive foramina and relatively smaller audital bullæ. *Nasals extending conspicuously behind nasal branches of premaxillaries.* White of inner side of thigh continued along lower leg to join that of foot, as in *Mus jerdoni.*

Fur.—The fur is as in *Mus jerdoni* and *M. cremoriventer.*

Color.—Back and sides clay color tinged with ochraceous, particularly on shoulders and flanks, and everywhere darkened by mixture of Vandyke brown, the latter in excess over middle of back, nearly disappearing on sides. Underparts white, sharply defined, this color extending down inner side of legs and covering dorsal surface of feet. Muzzle hair brown. Face and crown like back. An ill defined brown eyering. Between ears there is a conspicuous elongate white spot, possibly due to albinism. Ears dark brown. Tail bicolor, but not sharply so, light brown above, whitish below, the colors becoming indefinite near tip.

Tail.—The tail is indistinctly annulated; ten rings to the centimeter at middle. The rings are not sharply defined. Each is divided into segments distinctly broader than long. From beneath the free edges of the rings grows numerous hairs whose length about equals width of two rings. These hairs are not definitely arranged, and from one to four spring from each section. At tip the rings become very irregular, but the hairs, contrary to the general rule, are reduced in length.

Skull.—Though noticeably larger than that of *Mus jerdoni* the skull of *Mus pellax* does not differ from it in general form. The audital bullæ are a shade smaller than in *Mus jerdoni,* therefore relatively of much less size. Incisive foramina short and broad, the outer margins converging anteriorly. Nasals extending nearly 3 mm. behind nasal branches of premaxillaries. At anterior extremity each nasal is emarginated on outer side so that the two together form a narrow median point. Otherwise the skull agrees with that of *Mus jerdoni.*

Teeth.—The teeth are much broader than those of *Mus jerdoni.* Enamel pattern as in *M. jerdoni* and *M. decumanus* except in the presence of a minute supplemental tubercle between first and second tubercles on inner side of second upper molar. Though present and perfectly symmetrical in the tooth of each side it is probably not a normal character.

Measurements.—External measurements of type: total length, 317; head and body, 152; tail vertebræ, 165; hind foot, 35 (33); ear from meatus, 21; ear from crown, 16; width of ear, 17.

Cranial measurements of type: greatest length, 41; basal length, 34; basilar length, 31; palatal length, 17; least width of palate between anterior molars, 4; diastema, 11.5; length of incisive foramen, 6; combined breadth of incisive foramina, 3; length of nasals, 16; combined breadth of nasals, 4.8; zygomatic breadth, 18; interorbital breadth, 6.4; mastoid breadth, 14; breadth of braincase above roots of zygomata, 16; depth of braincase at front of basioccipital, 10.8; fronto-palatal depth at posterior extremity of nasals, 8.8; least depth immediately behind incisors, 7; maxillary toothrow (alveoi), 6.8; width of first upper molar, 2; mandible, 21.5; mandibular toothrow (alveoli), 6.5.

Specimens examined.—One, the type.

Remarks.—While this species is very distinct from *Mus jerdoni*, its relationship to *Mus surifer* is questionable. Dr. Abbott writes that he examined numerous individuals and that in the flesh they could be invariably distinguished from the species with which they were associated. The white spot on the head he regards as a normal character.

Mus surifer sp. nov.

Type adult male (skin and skull) No. 86,746 United States National Museum, collected in the mountain of Trong, Lower Siam, at an altitude of about 3,000 feet, January 14, 1899.

Characters.—In general appearance much like *Mus jerdoni* and *M. pellax*, but larger and more robust than either. Fur thickly spiny. Tail about equal to head and body, though usually somewhat longer, bicolor with exception of terminal third or fourth, which is entirely dull white. *Hind leg from knee to heel usually ochraceous on both sides* thus separating white of inner side of thigh from that of foot. Skull much larger and more conspicuously ridged than that of *Mus jerdoni.*

Fur.—The fur is as in *Mus jerdoni* and *M. cremoriventer.*

Color.—Upper parts uniform tawny ochraceous, heavily sprinkled with blackish brown on posterior half of back, less so on shoulders and head. Sides, flanks, cheeks and outer surface of legs clear tawny ochraceous. Underparts white to base of hairs. The white extends down inner sides of front legs to wrists, but on hind legs it normally reaches barely beyond knee, below which the entire leg is ochraceous, though slightly dulled on inner side by the dusky bases of the hairs. Occasionaly, however, the white extends in a narrow irregular line to heel. Feet dull white. Ears and dorsal surface of tail to terminal third or fourth dark brown. Underside of tail and whole of terminal third or fourth dull white.

Tail.—The tail is distinctly annulated, though less evenly than in *Mus cremoriventer.* There are about 12 rings to the centimeter at middle. The rings are indistinctly divided into sections slightly longer than broad, from the free edge of each of which spring 1-3 hairs equal in length to width of about one and one half rings. At tip the rings become narrower and less regular, the hairs at the same time increasing in abundance, but not in length, and not forming a pencil.

Skull.—The skull of *Mus surifer* (Pl. V, Fig. 4) is conspicuously larger than that of *M. jerdoni* (Pl. V, Fig. 1), though not very different in form. Supraorbital ridges high and continued backward to interparietal, and in old individuals forming a strong postorbital angle. Incisive foramina relatively much shorter and wider than in *Mus jerdoni*, distinctly wider posteriorly than anteriorly.

Teeth.—The teeth are relatively broader than in *Mus jerdoni*, but in structure they show no peculiarities.

Measurements.—External measurements of type: total length, 400; head and body, 197; tail, 203; hind foot, 38 (36); ear from meatus, 21.5; ear from crown, 18; width of ear, 15. Ten specimens (five of each sex) from the type locality average: total length, 372 (356-400); head and body, 187 (162-197); tail vertebræ, 185.5 (175-203); hind foot, 38.6 (36-40); hind foot without claws, 35.8 (34-39).

Cranial measurments of type: greatest length 46 (36.6)*; basal length, 40 (30); basilar length, 37 (27.6); palatal length, 19 (14.8); least width of palate between anterior molars, 4.6 (3.8); diastema, 13.4 (9.4); length of incisive foramen, 7.4 (6.6); combined breadth of incisive foramina, 4 (3); length of nasals, 18.6 (14); combined breadth of nasals, 5 (3.6); zygomatic breadth, 19.8 (15.4); interorbital breadth, 7.6 (6); mastoid breadth, 15 (13); breadth of braincase above roots of zygomata, 16 (15); depth of braincase at front of basioccipital, 12 (10.4); frontopalatal depth at posterior extremity of nasals, 9 (8); least depth of rostrum immediately behind incisors, 8 (6.8); maxillary toothrow (alveoli), 7 (6); width of front upper molar, 2 (1.6); mandible, 24.6 (18.6); mandibular molar series (alveoli), 7 (5.8).

Specimens examined.—Twenty-one, all from the type locality.

Remarks.—*Mus surifer* is somewhat closely related to *Mus jerdoni*, though immediately distinguishable by its much greater size. Two adult specimens of the latter measure: total length, 325 and 322; head and body, 200 and 192; tail vertebræ, 125 and 130; hind foot, 31.5 (30.5) and 30.5 (29.5); ear from meatus, 19 and 19; ear from crown, 16 and 16; width of ear, 14 and 13. Externally *Mus surifer* is probably much like the Bornean *Mus rajah* Thomas; but the skull is considerably smaller. Some of the cranial measurements of the type of *Mus rajah* are: greatest length, 51; basilar length, 41; zygomatic breadth, 22; nasals, 19; diastema 14.5

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*Measurements in parenthesis are those of an adult specimen of *Mus jerdoni* from Mount Mooleyit, Burmah.

EXPLANATION OF PLATES.

(All figures slightly less than natural size.)

PLATES III AND IV.

Fig. 1. *Mus validus.* Type.

Fig. 2. *Mus ferreocanus.* Type.

Fig. 3. *Mus vociferans.* Type.

Fig. 4. *Mus bowersi.* Adult male, Yado, Burmah (Genoa Museum).

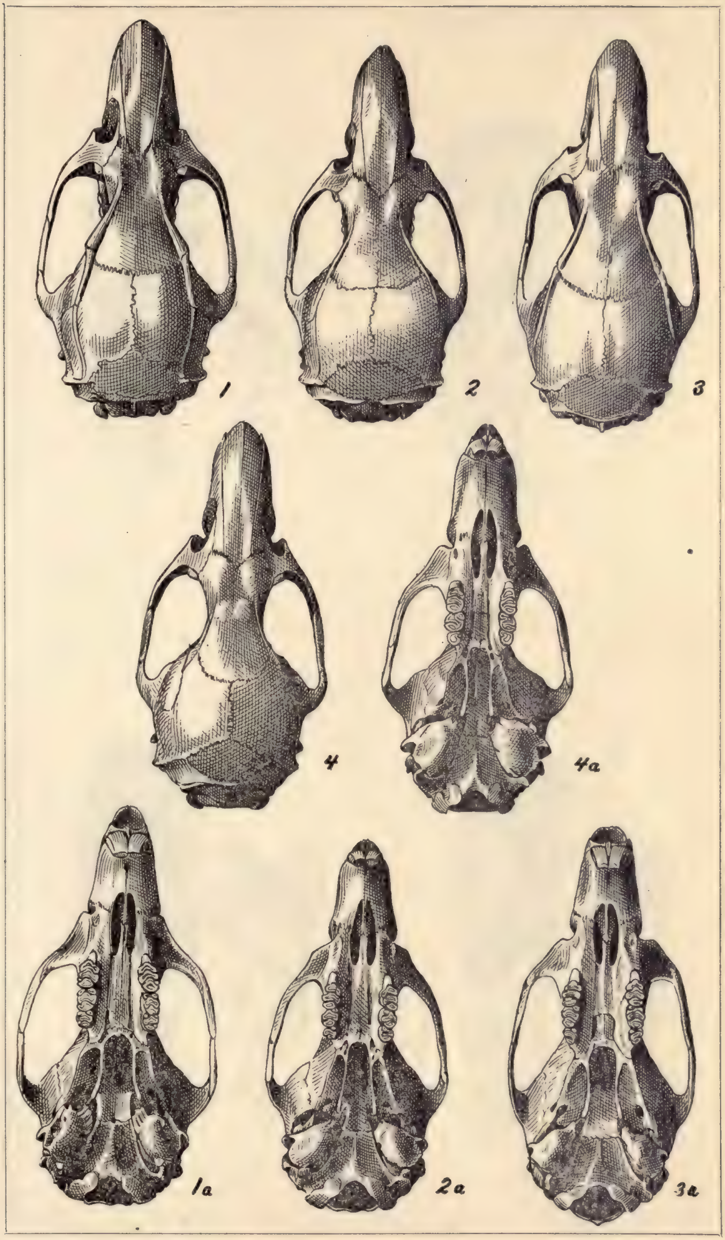
PLATE V.

Fig. 1. *Mus jerdoni.* Adult female No. 101,520, United States National Museum. Mount Mooleyit, Burmah.

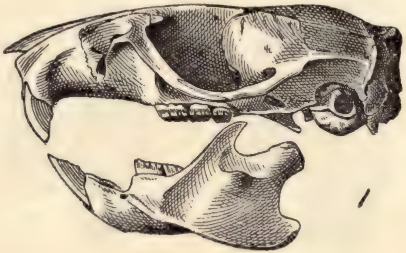
Fig. 2. *Mus cremoriventer.* Type.

Fig. 3. *Mus asper.* Type.

Fig. 4. *Mus surifer.* Topotype. No. 86,760, United States National Museum. (A much younger specimen than that of *M. jerdoni.*)


1
2
3
4
4a
1a
2a
3a

1. Mus validus.
2. Mus ferreocanus.
3. Mus vociferans.
4. Mus bowersi.



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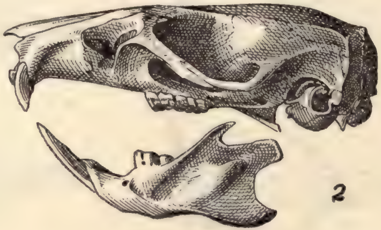
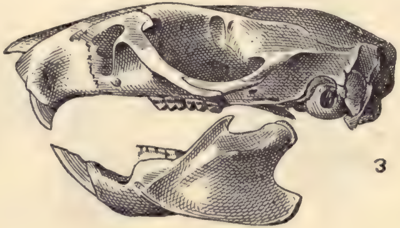


2



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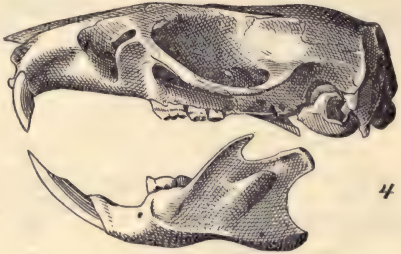
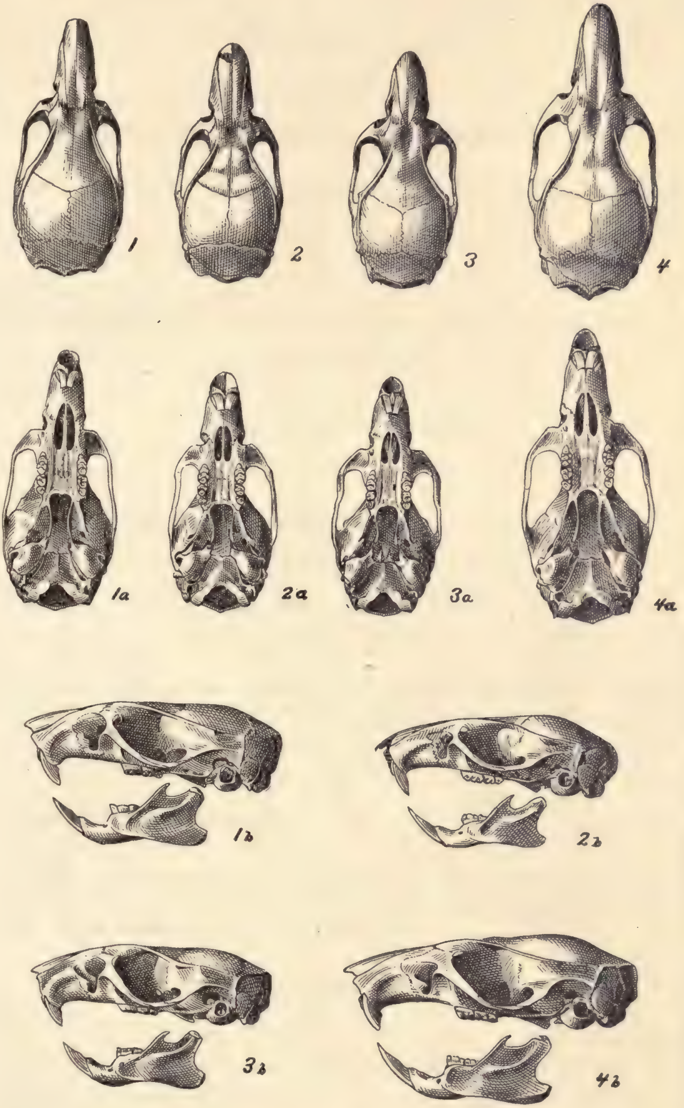


4

1. Mus validus. 2. Mus ferreocanus. 3. Mus vociferans. 4. Mus bowersi.


1
2
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1a
2a
3a
4a
1b
2b
3b
4b

1. Mus jerdoni.
2. Mus cremoriventer.
3. Mus asper.
4. Mus surifer.

VOL. XIII, PP. 151-152 JUNE 13, 1900

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWO NEW MAMMALS FROM CALIFORNIA.

BY C. HART MERRIAM.

Sciuropterus oregonensis stephensi subsp. nov.

CALIFORNIA COAST FLYING SQUIRREL.

Type from Sherwood, Mendocino Co., Calif. (alt. 2500 ft.) No. 99,830 ♀ yg. ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 10, 1894, by F. Stephens. Orig. No. 2307.

Characters.—Similar to *oregonensis* but smaller and paler; underparts and underside of tail without trace of fulvous suffusion. Skull smaller; occipital region much more strongly decurved; frontals narrower interorbitally and broader posteriorly; nasals and premaxillæ narrower posteriorly.

Measurements.—Type specimen, ♀ ad: Total length 277; tail vertebræ 131; hind foot 37.

Remarks.—In coloration this subspecies resembles *klamathensis* much more closely than *oregonensis*, but it is slightly darker than *klamathensis* and has much smaller ears and audital bullæ.

Procyon pallidus sp. nov.

DESERT RACCOON.

Type from New River, Colorado Desert, Calif. No. 99,272 ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 16, 1899 by F. Stephens. Orig. No. 2246.

Characters.—Size medium; coloration uniform pale gray, very much paler and grayer than any other known form; head markings relatively narrow, the dark dividing the white bar between the eyes less distinctly black than in the other species. There is no yellowish suffusion in the pelage anywhere, not even on the tail. The tail rings may be traced all

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the way around although the basal ones on the underside are very indistinct.

Cranial characters.—Skull similar in general to that of *psora*, resembling it much more closely than that of *hernandezi*. It differs from *psora*, however, in having the jugal much narrower below the orbit, and in having the lower premolars larger and more crowded. The fourth lower premolar in particular is much more swollen than in *psora*.

Measurements.—(Type specimen, ♀, in flesh:) Total length 855; tail vertebræ 295; hind foot 128.

DESCRIPTION OF A NEW HARVEST MOUSE (REITHRODONTOMYS) FROM MEXICO.

BY C. HART MERRIAM.

Reithrodontomys chrysopsis sp. nov.

Type from Mt. Popocatapetl, Mexico. No. 52,031 ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected Feb. 25, 1893 by E. W. Nelson and E. A. Goldman. Orig. No. 4405.

Characters.—Size small; ears large and moderately haired; tail very long, slender and well haired; fur long and very soft; color golden-yellowish.

Color.—Upperparts from nose to tail rich bright golden-yellowish, somewhat darkened on back and rump by admixture of black hairs; underparts whitish suffused with pale salmon fulvous; ears and ankles dusky; fore and hind feet white; tail sharply bicolor: above dusky, below white.

Cranial characters.—Skull small and frail; braincase papery, inflated, subglobular posteriorly and everywhere well rounded; interorbital region narrow, without trace of supraorbital beads; zygomata slender but strongly notched by antorbital slits; rostrum small and very narrow; audital bullæ rather small; incisive foramina very long, cutting plane of first molars, and of even breadth throughout.

Measurements.—Type specimen: Total length 194; tail vertebræ 108; hind foot 21. Average of two specimens from type locality: Total length 185.5; tail vertebræ 100; hind foot 20.5.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWO NEW MAMMALS FROM SOUTHERN CALIFORNIA.

BY F. STEPHENS.

Perognathus panamintinus arenicola subsp. nov.

Type from San Felipe Narrows, San Diego Co., California. No. 99,828, ♂, U. S. Nat. Mus., Biological Survey Coll. Collected April 11, 1892 by F. Stephens. Orig. No. 2056.

Characters.—Similar to *P. panamintinus bangsi* but paler and whiter; mastoids greatly swollen and projecting much further back than the occiput; interparietal very small.

Measurements.—Total length, 141; tail vertebræ, 82; hind foot, 19.

Myotis californicus pallidus subsp. nov.

Type from Vallecito, San Diego Co., California. No. 99,829, ♂, U. S. Nat. Mus., Biological Survey Coll. Collected April 1, 1895 by F. Stephens. Orig. No. 2498.

Characters.—Size small; wings short, wing membrane thin and light; ears small; general appearance delicate, color very pale: light ochraceous buff or brownish cream buff; below dull white; basal part of pelage above and below blackish.

Measurements.—Total length, 80; expanse, 208; tail vertebræ, 42; ear, 11; thumb, 4; forearm, 30; tibia, 15.

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GENERAL NOTES.

The Vespertilio concinnus of Harrison Allen.

Through the kindness of Mr. Witmer Stone I have recently had the opportunity to examine the bats on which Harrison Allen based the name *Vespertilio concinnus* (Proc. Acad. Nat. Sci. Philadelphia, 1866, p. 280). The specimens, two in number, are in alcohol, and labeled "San Salvador, Dr. J. Leidy." Though much faded in color they are clearly referable to *Myotis nigricans* (Maximilian), or at least to that form of the species occuring in Columbia and southern Mexico. The name *concinnus* is therefore a synonym of *nigricans* unless the bat to which it was applied should eventually prove to be distinct from the true *nigricans* of Brazil, specimens of which I have not seen. In that case it would be tenable for the northern animal.—*Gerrit S. Miller, Jr.*

The generic name Evotomys not invalidated by Anaptogonia.

In a posthumous paper on the fauna of the Port Kennedy bone fissure (Journ. Acad, Nat. Sci., Philadelphia, 2d Ser. XI, p. 201) Cope substituted the name *Anaptogonia* Cope 1871 based on a fossil Microtine rodent for *Evotomys* Coues 1874 originally applied to the Redbacked Mice. The change was made on account of the supposed generic identity of the fossil and living animals. Through the courtesy of Mr. Witmer Stone I have recently had an opportunity to examine two specimens of *Anaptogonia* from the collection of the Philadelphia Academy of Sciences. This material shows that *Anaptogonia*, although provided with rooted molars, is in no way closely related to *Evotomys*. The teeth are as large as in *Microtus* (*Neofiber*) *alleni*, and the enamel pattern is characterized by acute angularity. The genus thus resembles the "*Arvicola intermedius*" of Newton and the *Dolomys* of Nehring. Therefore the name *Evotomys* as applied to the Redbacked Mice is in no way invalidated by the previous publication of *Anaptogonia*.—*Gerrit S. Miller, Jr.*

Note on Micronycteris brachyotis (Dobson) and M. microtis Miller.

In describing a bat from Greytown, Nicaragua, under the name *Micronycteris microtis* (Proc. Acad. Nat. Sci. Philadelphia, 1898, p. 328), I overlooked the fact that Dobson had previously (Proc. Zool. Soc. London, 1878, p. 880) described a member of the same genus from Cayenne, French Guiana, as *Schizostoma brachyote*, a name not cited in Trouessart's 'Catalogus.' The two animals are evidently much more distinct from each other than the similarity of their specific names would at first suggest. *Micronycteris brachyotis* is, with the exception of *M. behnii*, one of the largest species of the genus (forearm 40 mm.), while *M. microtis* is among the smallest (forearm 31). In *M. brachyotis* the upright portion of the noseleaf is "much narrower than the horse-shoe," and the prominences on the chin are of very peculiar form. In *M. microtis* the upright portion of the noseleaf is fully as wide as the 'horse-shoe,' and the prominences on the chin are exactly as in normal members of the genus.—*Gerrit S. Miller, Jr.*

The systematic name of the Cuban red bat.

In Ramon de la Sagra's Historia Fisica Politica y Natural de la Isla de Cuba, III, p. 32, 1845, Gervais describes the cuban red bat as *Vespertilio blossevillii.* Publication of the name he attributes to Lesson and Garnot, "Bull. Sc. Nat. VIII, p. 95." This reference I have not been able to verify, but it unquestionably antedates the publication of Gundlach's name *Atalapha pfeifferi* (1861) by sixteen years. The animal should therefore be known as *Lasiurus blossevillii.*—*Gerrit S. Miller, Jr.*

Note on the Vespertilio blythii of Tomes.*

In 1857 Tomes published a description of the Indian representative of *Myotis myotis* under the name *Vespertilio blythii* (Proc. Zool. Soc. London, 1857, p. 53). Recent authors have without exception regarded the animal as identical with the European form. A specimen collected by Dr. W. L. Abbott in Kashmir (♀ adult No. $\frac{21819}{37358}$ United States National Museum) shows, however, that this view is not correct, and that *Myotis blythii* is a well characterized species, readily distinguishable from *M. myotis* by its shorter ears, much smaller audital bullæ, and by a peculiarity in the form of the maxillary molars. In these teeth the protocone is lower and further removed from the paracone than in *M. myotis*, a character which is at once appreciable when the teeth of the two species are viewed in profile from the front. This peculiarity is evidently of considerable importance, as I can find no appreciable variation in the form of the molars among a large number of European specimens of *M. myotis.*—*Gerrit S. Miller, Jr.*

The Scotophilus pachyomus of Tomes a valid species.

Described in 1857 (Proc. Zool. Soc. London, p. 50) from specimens taken in India the *Scotophilus pachyomus* of Tomes has of recent years been regarded as inseparable from the European Serotine Bat (see Dobson, Catal. Chiropt. Brit. Mus., p. 191, and Blanford, Mamm. Brit. India, p. 303). Two individuals taken by Dr. W. L. Abbott in the Vale of Kashmir and now in the United States National Museum (Nos. $\frac{21684}{37306}$ and $\frac{21685}{37792}$) agree in all respects with the characters given by Tomes and show that the animal differs widely from *Vespertilio serotinus*. It is slightly larger than the European species, (forearm 52, foot 12 (10.4), tibia 22.4), the skull is broader anteriorly, the crowns of the upper molars are less narrowed on the lingual side and the color is much paler. Fur very silky in texture, about 3 mm. in length at middle of back. Hairs of dorsal surface light broccolibrown from base nearly to tip, then dark sepia, followed by silvery gray at extremity. The colors blend insensibly into each other, and the whitish tips of the hairs produce a frosted effect nearly as distinct as that in *V. murinus*. Fur of ventral surface very pale ecru drab at base, fading to whitish gray at tip; a fairly defined line of demarkation between colors of upper and lower surfaces. These characters are sufficient to distinguish *Vespertilio pachyomus* specifically from *V. serotinus*.—*Gerrit S. Miller, Jr.*

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A Bat of the genus Lichonycteris in South America.

Lichonycteris obscurus, the only known representative of its genus, was described in 1895 from a single adult female taken at Managua, Nicaragua (Thomas, Ann. and Mag. Nat. Hist., 6th ser., XVI, pp. 55-57, July, 1895). While identifying some old skins in the United States National Museum I recently found a specimen of this species labeled "Surinam, Edw. Koebel." It is without further history except that it was entered in the Museum register, as No. 14815 on March 6, 1885. The known range of the genus is thus greatly extended. In all respects the Surinam specimen exactly agrees with the character given in the original description.—*Gerrit S. Miller, Jr.*

The systematic name of the large noctule bat of Europe.

The first notice of the Large Noctule of southern Europe appears to have been published in 1869 by Fatio in the first volume of the "Faune des Vertèbrès de la Suisse. Here specimens taken in the trunk of a tree near Amsteg, Canton of Uri, Switzerland, were recorded as [*Vesperugo noctula*] var. *maxima* (Mammifères, p. 57). More recently the animal has been considered identical with the *Pterygistes lasiopterus* of China and Japan (For references see Trouessart, Catalogus Mammalium, I, p. 111). Two specimens from Pisa, Italy, recently obtained by the United States National Museum differ noticeably from a pair of *P. lasiopterus* collected some years ago by Mr. P. L. Jouy at Fusan, Corea. They are distinctly larger (forearm, ♂, 65, ♀, 68, instead of ♂, 60, ♀, 61), and the skull, in addition to its larger size (greatest length 22 instead of 20.4), differs in its more tumid rostrum, broader anterior nares, and narrower interpterygoid space. The European animal which in all probability is specifically distinct from *Pterygistes lasiopterus* should be known as *Pterygistes maximus* (Fatio).—*Gerrit S. Miller, Jr.*

A new subgenus for Lepus idahoensis.

The small rabbit described by Merriam in 1891 (North American Fauna No. 5, p. 76) as *Lepus idahoensis* differs too widely from members of any of the recognized subgenera to be associated with them. It may therefore be regarded as the type of a new subgenus *Brachylagus*. The characters are as follows: Skull short and deep, the disproportionately large audital bullæ and small rostrum (diastema shorter than orbit) producing a strikingly immature effect; supraorbital processes shorter than toothrow, their extremities free; posterior prism of second lower premolar and first and second lower molars less than half as large as anterior; ears, legs, and tail short, the latter not perfectly formed.—*Gerrit S. Miller, Jr.*

Antennaria solitaria near the District of Columbia.

Although not included in recent works on the flora of the northeastern United States, *Antennaria solitaria* is entitled to a place there. In May, 1899, I found the plant growing in dry, open, deciduous woods near the side of a road a mile or more east of Kensington, Montgomery Co., Maryland, well within the limits commonly assigned to the flora of the District of Columbia. It apparently occupies a small area only, though this year it has spread. The species has been recorded (as *Antennaria plantaginifolia β. monocephala*) from the vicinity of Philadelphia, Pa., (Torrey and Gray, Fl. N. Am., II, p. 431) and there is every reason to expect its occurrence throughout the Austral zones of the eastern United States.—*Gerrit S. Miller, Jr.*

Batrachium hederaceum in America.

Up to the present year, so far as I have been able to ascertain, *Batrachium hederaceum* (L.) S. F. Gray, has been credited to the following stations and collectors only: Virginia: Hampton ("Chesapeake City"), *Ward, 1877, Vasey, 1878*; Norfolk, *Ward, 1877, Muir;* Dismal Swamp, *Chickering, 1877;* Virginia Beach, *Britton & Small, 1893;* Newfoundland: Bona Vista Bay, *Osborn, 1879;* New Harbour, *Waghorne, 1889 and 1890;* Quiddy Viddy Lake, *Robinson & Schrenk, 1894.*

The first record by name of station of the introduction of this species from Europe is Dr. Watson's in the sixth edition of Gray's Manual, 1890. The second is Mr. J. M. Macoun's note (Bot. Gaz. **16**: 285. 1891) on the plants collected by the Rev. A. C. Waghorne, assigning to them the record of being the first collected in Canada. If Mr. Macoun had access to the specimens distributed by Mr. H. L. Osborn, he did not give them the first Canadian credit because they were distributed under the name *Ranunculus hyperboreus* Pursh.

Dr. Robinson in Gray's Synoptical Flora (Vol. I, Pt. 1, Fasc. 1; 22. 1895) cites Mr. Muir in connection with the station given in the Manual and appends a foot-note naming the above collectors except Messrs.

Ward, Vasey and Britton & Small. From these omissions I infer that their collections were not published or widely distributed.

Professor Ward tells me that when he and Dr. Morong were approaching the "Chesapeake City" station, he remarked that "that is a regular ranunculaceous pool." So it proved, for, besides *B. hederaceum* they collected *Ranunculus pusillus* and two other species.

With these two limited areas for the adopted habitat of this species it was a surprise to Mr. W. M. Pollock and myself, on May 6, 1900, to find specimens bearing flowers and fruit, in a large swamp bordering the Patuxent River at the mouth of its Western Branch, practically at the head of navigation. There were two distinct patches of the plant, one rather badly cut up by the passage of teams over a temporary farm road. The patches were growing in standing water about two inches deep, over a thin deposit of humus upon compact marl.

In Britton & Brown's Illustrated Flora (Vol. II; 84) the season of flowering is given as "June to August." The plants collected by Britton & Small were barely in flower on May 26. Professor Ward's specimens were barely in fruit on May 12. The plants from the new station were in full bloom and ripe fruit. These fruits probably could not have matured from flowers which were in anthesis later than the last week in April. With this collection, then, the range is increased and the known period of blossoming lengthened.

Dr. Britton writes me that the habit of the plant at Virginia Beach has led him to expect it elsewhere along tide-water areas. We shall interestedly await news of other stations.—*E. L. Morris, Dept. of Biology, Washington High Schools.*

Change of name.

Baptisia confusa Pollard and Ball, nom. nov.

B. Texana Pollard and Ball, Proc. Biol. Soc. Wash., 13:133. April 6, 1900.

B. lanceolata texana Holzinger, Contr. U. S. Nat. Herb., 1:286. Oct. 31, 1893. Not *B. Texana* Buckley, Proc. Acad. Sci. Phila., 452. 1862.

Through inadvertence, Mr. Holzinger's variety was elevated to specific rank in ignorance of the fact that the name *Texana* was applied many years ago by Buckley to another species. Our attention has been considerately called to the error by Dr. B. L. Robinson.—*Charles Louis Pollard, Carleton R. Ball.*

VOL. XIII, PP. 159-162 OCTOBER 31, 1900

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A SECOND COLLECTION OF BATS FROM THE ISLAND OF CURAÇAO.*

BY GERRIT S. MILLER, JR.

Mr. Leon J. Guthrie, United States Weather Observer at Willemstad, Curaçao, West Indies, has recently sent to the United States National Museum a second collection of bats preserved in formalin.† Three species are added to the known fauna of the island, though two of those previously obtained, *Myotis nesopolus* and *Leptonycteris curasoæ*, are not represented. The number of bats recorded from Curaçao is thus raised to six, all of which are so far as known peculiar to the island.

Glossophaga elongata Miller.

Twenty-seven specimens, taken from caves and rock fissues in different parts of the island, but chiefly from a large cave at Hatto, a country estate about thirty miles from Willemstad. Among the fifty-six individuals of this species examined four have the incisors noticeably defective, while in only one of these are the teeth absent. This condition is in marked contrast with that recently observed by Dr. J. A. Allen in a series of thirty-four specimens of the closely allied *Glossophaga longi-*

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†For account of the first collection, see Proc. Biol. Soc. Washington, xiii, pp. 123-127, April 6, 1900.

rostris of Colombia. Here the incisors were absent in about one-third of the individuals, and the full set was present in less than one-half.*

Mormoops intermedia sp. nov.

Type adult female (in alcohol) No. 102,174 United States National Museum, collected in cave at Hatto, on north coast of Curaçao, West Indies, April 29, 1900.

Characters.—Similar to the Mexican *Mormoops megalophylla* Peters, but smaller, the size intermediate between that of the two previously known species; color (at least in brown phase) slightly darker than in *M. megalophylla.*

Color.—Brown phase: entire dorsal surface sepia, the fur paler beneath the surface, and each hair tipped with light drab. The drab tips produce a distinct 'bloom' in certain lights. Underparts very pale yellowish broccoli-brown, lightest on belly, flanks and pubic region, faintly darker across chest. Red phase: like brown phase but entire pelage suffused with cinnamon. Pale phase: light salmon-buff above and below, becoming more red about shoulders and head. Ears and membranes dark brown in all three color phases. Individuals in the brown phase are the most frequent; those in the red phase are less often met with; while the pale phase is comparatively rare.

Membranes, ears, and other external characters as in *Mormoops megalophylla.*

Skull and teeth.—While the skull exactly resembles that of *Mormoops megalophylla* the teeth are distinguishable by the greater size and consequent crowding of the upper premolars. The anterior premolar is distinctly broader than in *M. megalophylla* and it usually fills the entire space between canine and posterior premolar. The lower premolars are slightly larger than in the Mexican animal.

Measurements.—External measurements of type specimen: total length, 80; tail, 20; tibia, 20; foot, 9; calcar, 20; forearm, 48; thumb, 6.4; second digit, 45; third digit, 90; fourth digit, 6.6; fifth digit, 57; ear from meatus, 14; ear from crown, 9. Average of twenty topotypes: tail, 20.9 (18-22); forearm, 49.6 (48-51).†

Specimens examined.—One hundred and sixty-four from caves and rock crevices in all parts of the island.

Remarks.—Mormoops intermedia is readily distinguishable from *M. megalophylla* by its size and more crowded upper premolars. With the Jamaican *M. blainvillii* it needs no comparison. The color phases in this bat are very striking.

Natalus tumidirostris sp. nov.

Type adult male (in alcohol) No. 102,106 United States National Museum, collected in cave at Hatto, on north side of island of Curaçao, West Indies, May 1, 1900.

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*Bull. Am. Mus. Nat. Hist., N. Y., xiii, p. 89, May 12, 1900.

†Average of twenty specimens of *M. megalophylla* from Mirador, Vera Cruz, Mexico; tail, 27.8 (26-32); forearm, 54 (53-57).

Characters.—Externally similar to Mexican specimens of *Natalus stramineus* Gray, but fingers shorter and ears somewhat more pointed. Skull with braincase more abruptly elevated than in the Mexican species, and *rostrum conspicuously inflated at sides.* Teeth throughout larger than in *N. stramineus*, the lower premolars noticeably broadened.

Color.—Dorsal surface uniform cream-buff, the tips of the hairs gradually darkening to pale drab; belly similar, but the buff slightly more tinged with yellow and the drab less apparent. Ears and membranes light brown.

Ears.—The ear is essentially as in *N. stramineus*, but the point is distinctly longer and narrower.

Membranes, feet, and other external characters as in *N. stramineus.*

Skull.—Though in general appearance the skull of *Natalus tumidirostris* resembles that of *N. stramineus* it is immediately distinguishable by the conspicuously swollen sides of the rostrum. The inflation involves the maxillary bones from anterior edge of orbit almost to nares, and from near edge of toothrow to nasals. As the nasals retain the normal form they appear to occupy the floor of a broad, shallow, longitudinal groove. In the type the braincase rises above the dorsal plane of the rostrum at an angle of 50°, in a second specimen at an angle of 58°. In two specimens of *N. stramineus* the angle is respectively 34° and 40°. In both specimens of *Natalus tumidirostris* the bony palate terminates on each side at the plane of the postero-internal angle of the crown of the second molar. In the median line it is continued slightly further back along palatal face of vomer. The resulting form is strikingly different from that of the palate in other members of the genus. It is possible, however, that the palate is normal and that its peculiarity in the two specimens is the result of injury. As both skulls were cleaned by an experienced preparator there seems little probability that the palate was originally of the usual form.

Teeth.—The dentition is throughout heavier than in *N. stramineus*, and the form of the individual teeth differs in many important details. Canines and incisors as in *N. stramineus.* Relative size of upper premolars as in *N. stramineus*, that is the crown area decreasing regularly from third to first, the latter equal to about one-half former, but cusp of first slightly longer than that of second. In each tooth the transverse diameter is greater relatively to the longitudinal diameter than in the Mexican animal. Upper molars broader than in *N. stramineus*, the posterior commissure of protocone of first and second *distinctly marked by a rudimentary hypocone.* The lower premolars and molars differ from those of *N. stramineus* in greater breadth of crown, this character especially noticeable in the second and third premolars.

Measurements.—External measurements of type (♂) and paratype (♀): total length, ♂ 96, ♀ 94; tail, ♂ 47, ♀ 45; tibia, ♂ 18.4, ♀ 17.6; foot, ♂ 7, ♀ 8; forearm, ♂ 36, ♀ 35; thumb, ♂ 5, ♀ 4.8; second digit, ♂ 35, ♀ 35; third digit, ♂ 72, ♀ 69; fourth digit, ♂ 52, ♀ 50; fifth digit, ♂ 51, ♀ 49; ear from meatus, ♂ 15.4, ♀ 15.4; ear from crown ♂ 11.4, ♀ 12.

Specimens examined.—Two, both from the type locality.

Remarks.—This species requires no special comparison with other members of the genus, its tumid rostrum at once distinguishing it.

Molossus pygmæus sp. nov.

Type adult female (in alcohol) No. 102,104 United States National Museum, collected in an attic near Willemstad, Curaçao, West Indies, January 16, 1900.

Characters.—Considerably smaller than *Molossus obscurus;* color paler and molar teeth narrower than in the mainland animal.

Color.—Back broccoli-brown faintly washed with drab, the hairs whitish gray through basal half, this color appearing irregularly at surface. Belly drab-gray the hairs faintly whitish through basal half.

Skull and teeth.—Except for its smaller size the skull does not differ noticeably from that of mainland specimens. The crowns of the molar teeth are, however, relatively narrow. Rudimentary hypocone of first upper molar nearly obsolete.

Measurements.—External measurements of type: total length, 86 (98)*; tail vertebræ, 34 (38); tibia, 11.8 (14); foot, 6.8 (7.8); forearm, 35 (39); thumb, 6 (6.4); second digit, 35 (40); third digit, 70 (78); fourth digit, 52 (60); fifth digit, 37 (42); ear from meatus, 10 (12); ear from crown, 8 (10); width from ear, 10 (14).

Cranial measurements of type: greatest length, 14.8 (16.4)*; basal length, 13 (14.8); basilar length, 11 (13.6); lachrymal breadth, 4.8 (5.4); least interorbital breadth, 3 (4); zygomatic breadth, 9.6 (10.6); mastoid breadth, 9 (10); greatest beadth of braincase, 8 (9); depth of braincase, 5 (6); mandible, 10.4 (11.8); maxillary toothrow (exclusive of incisors), 5.6 (6); mandibular toothrow (exclusive of incisors), 6 (7).

Specimens examined.—One, the type.

Remarks.—*Molossus pygmœus* belongs to a group of species the numbers of which are even smaller than *M. obscurus* and its allies. The animal is probably confined to the island of Curaçao.

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*Measurements in parenthesis are those of an adult female *Molossus obscurus* from La Guaira Venezuela.

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A NEW GERBILLE FROM EASTERN TURKESTAN.*

BY GERRIT S. MILLER, JR.

Three specimens of *Gerbillus* collected by Dr. W. L. Abbott in Eastern Turkestan near Aksu and in the jungle east of Maral'bashi have heretofore been referred with some hesitation to *G. przewalskii* Büchner, a species known from a few localities in the Tarim Valley near Lob Nor on the opposite side of the Desert of Gobi. A paratype of Büchner's animal received in exchange from the St. Petersburg Museum shows that the identification of the Aksu specimens is incorrect and that they represent a distinct and easily recognizable species.

Gerbillus arenicolor sp. nov.

Type adult male (skin and skull), No. 62,143 United States National Museum, collected in the jungle on Yarkand River, east of Maralbashi, Eastern Turkestan, February 9, 1894.

Characters.—In size and form similar to *Gerbillus przewalskii* Büchner, but color light sandy gray instead of pale yellowish buff.

Color.—Dorsal surface of body and head a fine sandy grizzle produced by a mixture of pale buff, dark brown, and pale ecru-drab, the brown most conspicuous near median line, but never in excess of the paler colors, the ecru-drab especially noticeable on sides, cheeks and shoulders. Ears and ill defined area immediately surrounding each dull white. A whitish spot above and slightly behind eye. Underparts and entire front leg white. On hind leg the color of back extends nearly to ankle. Feet white, slightly gray-tinged. Fur of colored area of pelage gray (Ridgway, No. 6) through a little more than basal half, that of uncolored area white to base. Tail uniform pale buff throughout.

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Skull.—The skull closely resembles that of *Gerbillus przewalskii*, but the rostrum appears to be more slender (particularly when viewed from below) and the braincase longer in proportion to its breadth. In each of the three specimens of *G. arenicolor* the mastoid breadth is distinctly less than the distance from posterior edge of interparietal to nasofrontal suture, while in the paratype of *G. przewalskii* it is equal to this distance. Mandible and teeth as in *G. przewalskii.*

Measurements.—External measurements of type: total length, 162; head and body, 89; tail vertebræ, 73; hind foot, 26.4 (24).

Cranial measurements of type: greatest length, 27.4 (26)*; basal length, 24 (23); basilar length, 22 (21); nasals, 9 (8.6); diastema, 8 (7); zygomatic breadth, 16 (15); least interorbital breadth, 6 (6); mastoid breadth, 15 (15); distance from posterior margin of interparietal to naso frontal suture, 17.4 (15); mandible, 14.8 (14); maxillary toothrow (alveoli) 4 (4); mandibular toothrow (alveoli), 4 (4).

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*Measurements in parenthesis are those of the paratype of *G. przewalskii.*

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GENERAL NOTES.

The Systematic Name of the Cuban Red Bat.

In this journal Mr. Gerrit S. Miller, Jr., recently (xiii, p. 155, June 13, 1900) raised the question of the proper systematic name of the Cuban Red Bat, *Lasiurus pfeifferi* (Gundlach, 1861, et auct. recent.), claiming that it should be *L. blossevillii* Gervais, or Lesson and Garnot. The history of the name *blossevillii* is as follows: In 1826, Lesson and Garnot (Voy. de la Coquille, I, 1826, 137, pl. ii, fig. 1) described and figured a bat of the genus *Lasiurus*, from the Rio de la Plata, as *Vespertilio bonariensis*. In an unsigned abstract of this work in Férussac's Bulletin des Sciences naturelles et de Geologie, Vol. xiii, 1826, pp. 95, 96, under the title "Mammifères nouveaux ou peu connu, décrits et figurés dans l'Atlas zoologique du Voyage autour du monde de la corvette la Coquille; par MM. Lesson et Garnot," descriptions are given of seven species of mammals, of which the first is *Vespertilio blossvillii,* the description being a transcript of the Latin diagnosis of *Vespertilio bonariensis* from Lesson and Garnot's "Voyage," with the addition "Hab. Monte-Video." As the plate carries the name *Vespertilio bonariensis* as well as the text, the name *Vespertilio blossevillii* is evidently a pure synonym of *V. bonariensis*. The suggestion of the name *blossevillii* is evidently to be found in Lesson and Garnot's text; these authors say that this bat "de Buenos Ayres nous fut remis par l'un de nos officiers, M. de Blosseville, qui le prit sur un vaisseau mouillé dans la riviére de la Plata."

Gervais, in 1845 (in R. de la Sagra's Hist. fis., polit. y nat. de la Isla de Cuba, iii, 32) simply applied the name *Vespertilio blossevillii* to the Cuban Red Bat (subsequently named *Atalapha pfeifferi* by Gundlach, in 1861), believing it to be specifically the same as that described by Lesson and Garnot, as above explained, rightly citing for the name Férussac's Bulletin, but wrongly citing for it Lesson and Garnot's report on the zoology of the Voyage of the Coquille. The proper systematic name of the Cuban Red Bat is, therefore, *Lasiurus pfeifferi* (Gundlach) as of late currently employed.—*J. A. Allen.*

On the occurrence of a Bat of the genus Mormoops in the United States.

An adult female of *Mormoops megalophylla* Peters, a bat new to the United States was taken by me at Fort Clark, Kinney County, Texas, December 3, 1897. A lady called me to her house to see a 'very remarkable bat' which had attached itself to the inner side of a door-screen. I found this bat very much alive, at a season when all other bats of the locality were dormant or had migrated. No other bats were seen until the following March, when the common *Nyctinomus* reappeared in the usual abundance. This specimen (No. 84,801, collection of the United States National Museum; original No. 4273) identified by Mr. Gerrit S. Miller, Jr., presented the following measurements, taken from the fresh specimen: Length, 90 mm.; length of caudal vertebræ, 28; alar expanse 373; longest finger, 90; head, 17; forearm, 56.—*Edgar A. Mearns.*

A Correction relative to the Tarsier.

The specific name of the Tarsier is generally published as *tarsius*, but an examination of the original description (Erxleben, Systema Regni Animalis, p. 71, 1777), shows that *tarsier* is the original form. The correct combination is *Tarsius tarsier* (Erxleben).—*James A. G. Rehn.*

An older Name for the Aard Vark.

The name *Myrmecophaga afra* was applied by Pallas (Miscellanea Zoolgica, p. 64, 1766) to the Aard Vark, as he calls the animal himself. As the description is as accurate as that of *capensis* Gmelin, it should unquestionably replace the latter. The combination should be *Orycteropus afra* (Pallas).—*James A. G. Rehn.*

An older Name for the Ogotona.

In 1776 Pallas (Reise, Th. iii, bd. 2, p. 692) applied the name *Lepus davuricus* to the Ogotona, and two years later he renamed the same animal *Lepus ogotona* (Nov. Sp. Glir., p. 65, 1778). As we should accept the older name, the combination would be *Ochotona davuricus* (Pallas).—*James A. G. Rehn.*

The proper Name of the Viscacha.

In 1786 a German edition of Molina was published by Brandis, entitled 'Versuch einer Naturgeschichte von Chili'. On page 272 he applies the name *Lepus viscaccica* to 'La Viscacha' of Molina, and the description appended clearly shows that he had in view the same animal that Blainville called *Dipus maximus* in 1817. Mr. Gerrit S. Miller, Jr., who kindly examined a copy of Molina's 1776 edition for me, states that no binomial names are used in it. On this basis, the animal should be known as *Vizcacia viscaccica* (Brandis).—*James A. G. Rehn.*

An older Name for the Norway Rat.

Erxleben ('Systema Regni Animalis', p. 381, 1777), applied the name *Mus norvegicus* to the rat which was named *decumanus* by Pallas one year later; accordingly it should replace the latter name.—*James A. G. Rehn.*

On the recent Occurrence of the Black Rat in Boston, Massachusetts.

Under date of July 11, 1900, Mr. Frank Blake Webster, of Hyde Park, Mass., wrote me as follows: "About a year ago, a young man who lived in Boston said there were black rats in a store there. We had him obtain a specimen, which was mounted, and which we still have. During the many years that I have been engaged in business in the city of Boston I have never seen one". The specimen was sent to me and identified as *Mus rattus* by Doctor J. A. Allen and myself.—*Edgar A. Mearns.*

Note on Dipodomys Montanus Baird.

Among the mammal types treasured in the collection of the United States National Museum is the type of Baird's *Dipodomys montanus*, originally described in the Proceedings of the Philadelphia Academy of Natural Sciences, in 1855, but figured and more fully elaborated in that author's Mammals of North America, published in 1857. This well-marked species proves on comparison to be strictly identical with *Dipodomys elator* Merriam, named and described in the Proceedings of the Biological Society of Washington, in 1894, from specimens taken at Henrietta, Clay Co., Texas, about 450 miles southeast of Fort Massachusetts. The synonomy of *Dipodomys montanus* will therefore be as follows:

Dipodomys montanus Baird, Proc. Acad. Nat. Sci. Phila., April, 1855, p. 334 (Fort Massachusetts).

Dipodomys ordii var. *montanus* Baird, Mamm. North America, 1857, pp. 410, 411, 757, 762, pl. lxxxiii, fig. 4, *a*, *b*, *c* (teeth of type—No. $\frac{1631}{490}$, a youngish adult). Type collected by Captain E. G. Beckwith, near Fort Massachusetts ("N. M.—On head of Rio Grande, in San Luis valley. Altitude, 8,365 feet. Latitude, 37° 32′; longitude, 105° 23′").

Dipodomys elator Merriam, Proc. Biol. Soc. Wash., Vol. ix, p. 109, June 21, 1894 (type from Henrietta, Clay Co., Texas).

Edgar A. Mearns.

Remarks on an unusually large Marine Lobster caught off Newport, Rhode Island.

I am indebted to Mr, Charles E. Ash, of Newport, for the opportunity of examining a lobster of unusually large size, taken off the island of Rhode Island, June 16, 1900, by a fisherman who was trawling for cod, using a line to which many hooks were attached. Lobster-pots are too small for the capture of very large lobsters. This one weighed 27 pounds, and ranks with the largest examples of its species. The crushing claw is on the left side. This lobster is normal and perfect in all its parts.

In the Bulletin of the American Museum of Natural History, N. Y., (Vol XII, pages 191-194, plate IX, published December 30, 1899), Professor R. P. Whitfield published a description and measurements of two phenomenally large lobsters, captured off Atlantic Highlands, New Jersey, during the spring of 1897. For convenience of comparison, I have followed the measurements of these two specimens, as taken by Doctor E. O. Hovey of the American Museum, presenting those of the present specimen in the third column (No. 3), Nos. 1 and 2 being those from New Jersey.

MEASUREMENTS OF THREE LARGE LOBSTERS.

	No. 1. mm.	No. 2. mm.	No.3, mm.
Length of carapace, including rostrum, along median line,	257	280	270
Circumference of carapace behind second pair of legs,	268	486	493
Length of abdomen to point of telson	300	311	310
Breadth of tail,	230	223	270
Large chelate limbs: right side, length of first two joints	160	165	186
" " " third joint	120	122	116
" " " fourth joint	360	365	370
" " " thumb	145	201	198
" circumference of third joint	236	248	215
" circumference of fourth joint	442	348	310
" length of whole limb	570	610	525
left side, length of first two joints	171	183	186
" " " third joint	118	124	109
" " " fourth joint	360	375	360
" " " thumb	198	155	162
" " " whole limb	580	615	523
" circumference of third joint	237	263	255
" circumference of fourth joint	339	491	425
Entire length as mounted	920	1005	960

"Length of antennæ exceeds 400 mm."

"The right limb bears the crushing claw in No. 1, but the left limb bears it in No. 2. The weight of No. 1 when caught was said to be 31 pounds; that of No. 2 was said to be 34 pounds."

In No. 3 (from Newport), the antennæ measured 550 mm. in length. Distance from rostrum to end of tail, 555. Greatest expanse of chelate limbs, 1025.

Mr. Charles E. Ash has presented this specimen to the United States National Museum, at Washington.—*Edgar A. Mearns.*

A new southern Violet.*

Viola Alabamensis Pollard, n. sp.

Acaulescent, of dwarf and spreading habit, from slender nearly vertical rootstocks; leaves small, sparingly hirsute, the blade cordate, suborbicular, 1.5 to 2 cm. in length, the slender petiole as long or twice as long; flowering scapes greatly exceeding the foliage (7 to 8 cm. long) the flower purple, 2.5 cm. in diameter; petals broadly oblong, the margins obscurely erose or fimbriate; sepals small, ovate-lanceolate; cleistogamous flowers and fruit not observed.

Type in the herbarium of Dr. Charles Mohr, collected by Dr. Denny at Sucksville, Washington County, Alabama, in 1852. Specimens collected by Dr. Mohr himself at Cullman, Alabama, March 22, 1889, are obviously also to be referred here. The habitat is stated by Dr. Mohr to be "dry open copses" and the plant is evidently confined to the upland portions of the state. Though related to *V. villosa* Walt., and *V. carolina* Greene it suggests neither in habit or floral characters.—*Charles Louis Pollard.*

The correct name for the eastern form of the Fox Squirrel (*Sciurus ludovicianus*).

In the Annals and Magazine of Natural History for 1867 (3d ser., xx, p. 425), Dr. J. E. Gray described *Macroxus neglectus* based on the skin of a female in the British Museum. The habitat was given as 'North America?' and Dr. Gray added to the imperfect description the remarks that it was 'A heavy animal as large as *Sc. vulpinus* and *Sc. cinereus*, very like the latter,' &c.

While preparing my 'Revision of the Squirrels of Mexico and Central

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America,[1] I found it necessary in several cases to apply to Mr. Oldfield Thomas of the British Museum for information concerning the specimens Gray had in hand when preparing his brief descriptions. Mr. Thomas very kindly looked up Gray's types and gave me exactly the information necessary to settle the status of various species. Among others I asked about Gray's *Macroxus neglectus* and Mr. Thomas wrote that the type of this species (No. 44.5.29.9 of the British Museum register) is a common fox squirrel of the *cinereus* type and is entered as having been collected at Wilmington, Delaware, by H. Doubleday. Mr. Thomas adds that 'Gray did not trouble to look out the locality in the register' and thus accounts for the indefinite locality given.

In Mr. O. Bangs' 'Review of Squirrels of Eastern North America'[2] the fox squirrel of the northeastern United States is described as *Sciurus ludovicianus vicinus* with the type from White Sulphur Springs, West Virginia. Gray's *Macroxus neglectus* came from the midst of the range given by Mr. Bangs for his *S. l. vicinus* and it follows therefore that the fox squirrels from Northern Virginia to Southern New York and New England should be called *Sciurus ludovicianus neglectus* (Gray).—*E. W. Nelson.*

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[1] Proc. Wash. Acad. Sci., I, pp. 15-106, 1899.

[2] Proc. Biol. Soc. Washington, X, 150 (Dec. 28, 1896).

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SOME PLANTS OF WEST VIRGINIA.

BY E. L. MORRIS.

During July and August, 1900, in company with Messrs. Hay, Holt, Miller, Roller and Sterrett, of the United States Fish Commission, to whose aid he is indebted in no small degree, the writer botanized a little in that part of West Virginia which is south of the Greenbrier, New and Kanawha Rivers and east of a northeast and southwest line bisecting the state lengthwise. This portion of West Virginia comprises Summers, Monroe, Mercer, McDowell, Wyoming and Raleigh Counties, given in the order of travel. The nature of these counties is very mountainous, though no very high altitudes are reached, the extremes of the points visited being 975 feet at Iaeger, McDowell County, and 3700 feet on East River Mountain, between Mercer County, West Virginia, and Bland County, Virginia, while there are points reaching slightly over 4100 feet. Though the larger rivers trend in a westerly or northwesterly direction there are no definite chains of mountains in these counties extending for more than a few miles, their ranges being abruptly cut off by river tributaries of all sizes. These small streams flow from all directions through such short and deep valleys that the whole country is choppy. The advantage to the botanist therefrom is the abundance of variety in the direction of surface exposure, of springs and small streams, of sandstone and limestone cliff and talus formations, of vast forest tracts not until the present falling to the axe, and of occasional stretches, narrow to be sure, of bottom-land along the larger streams. The great impression is that of many mountains for the most part well timbered. The impression from minute characters is that there is a constant supply of moisture. Although the Summer of 1900 was so dry that many springs and streams reputed to be constant went dry, the mountains not yet deforested were covered with a rich, moist humus; the rocks were hidden under mosses and lichens till the surface looked like a vast tapestry; the fields and open hillsides, exposed to the sun, supported everywhere between the stems and roots of higher plants a filling of mosses and liverworts. These conditions are traceable to the nightly enveloping of every summit and the filling of every valley with clouds.

In making the following records and collections, the writer practically was limited by other requirements to the country immediately adjacent to the roads traversed from camp to camp, along a few of the streams, and to only three summits of mountains. Mr. Wm. R. Maxon of the National Herbarium has kindly determined and described as new a subspecies of *Polypodium.*

The object of publishing this list, containing forty-seven species unreported from West Virginia, and two new subspecies is to show the need of very active collecting in the extreme southern part of the State to approximately complete the knowledge of its flora.*

Thallophyta.

Myxomycetes.

CERATIOMYXA FRUTICULOSA (Muell.) MacB. (Determined by O. F. Cook.)

Along Delashmeet Creek, Mercer County, altitude 2090 feet, July 25, 1900 (*Morris*, 946).

PHYSARUM RUFIPES (A. & S.)Morgan. (Determined by O. F. Cook.)

Along Tugg Creek, Hinton, Summers County, July 10, 1900 (*Morris*, 945).

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*Consult Millspaugh and Nuttall, Field Columbian Museum Publication 9. Bot. Ser. I, 2 (Flora of West Virginia), 1896.

STEMONITIS SMITHII MacB. (Determined by MacBride.)
As the first (*Morris*, 949).

LYCOGALA CONICUM Pers. (Determined by O. F. Cook.)
As above (*Morris*, 947).

Lycoperdaceae.

GEASTER HYGROMETRICUS Pers.
Along Horsepen Creek, McDowell County, July 30-August 1, 1900 (*Morris*, 1105a).

Ascomycetes.

DIMEROSPORIUM COLLINSII (S.) Thüm.
On *Carpinus Caroliniana*, Kegley, Mercer County, July 27, 1900 (*Morris*, 1078).

Discolichenes.

CLADONIA SYLVESTRIS L.
On the mountain between Barrenshe Creek and Dry Fork, McDowell County, altitude 1700 feet, August 6, 1900 (*Morris*, 1163).

Bryophyta.

Jungermanniaceae. (Determined by M. A. Howe.)

LEJEUNEA LUCENS Tayl.
On dripping limestone along Horsepen Creek between McDowell County, West Virginia, and Tazewell County, Virginia, altitude 1850 feet, July 31, 1900 (*Morris*, 1116b).

Anthoceraceae.

ANTHOCEROS LAEVIS L.
On dripping limestone along the Guyandot River below Baileysville, Wyoming County, altitude 1200 feet, August 15, 1900 (*Morris*, 1221).

Bryaceae. (Determined by Mrs. E. G. Britton.)

DICRANUM DRUMMONDII Muell.
On the mountain between Barrenshe Creek and Dry Fork, McDowell County, altitude 1700 feet, August 6, 1900 (*Morris*, 1165).

BRYUM ROSEUM Schreb.
Along Horsepen Creek, McDowell County, July 31, 1900 (*Morris*, 1119).

POGONATUM BREVICAULE Beauv.
North slopes on Road Run, Wyoming County, August 12, 1900 (*Morris*, 1176).

RHYNCHOSTEGIUM RUSCIFORME B. & S.
See under *Bryum roseum* (*Morris*, 1117).

Pteridophyta.

Polypodiaceae.

Polypodium vulgare oreophilum Maxon, subsp. nov.*

Rhizoma slender, extensively creeping, covered thickly with spreading chaff; stipe 5 to 8 inches long, greenish to stramineous; laminae very dark green above, lighter below, 7 to 11 inches long, 2½ to 4 inches broad; pinnae distant from once to twice their width, broadest in the middle and tapering to an acute apex, the margin doubly crenate or occasionally nearly entire, the base broadly decurrent, veins sinuous and prominent in drying, the veinlets usually forking twice; tip of lamina long acuminate, as in *P. falcatum;* sori very large, often irregularly disposed.

Type in the U. S. National Herbarium, Smithsonian Institution, collected by E. L. Morris, No. 1215, on rocks, along the Guyandot River below Baileysville, Wyoming County, W. Va., alt. 1100-1250 feet, August 13-19, 1900. This fern has already been briefly characterized† by Dr. Millspaugh as *Polypodium vulgare* forma *biserrata* (sic). The name *biserratum* being already preoccupied by a Mexican fern‡ it becomes necessary, in referring to the West Virginian plant, to substitute a new name. In addition I would refer here Mr. Morris' 1207 collected near the type station; also Pollard & Maxon's No. 25, collected Aug. 21, 1899, at Quinnimont, W. Va., which I have previously referred‖ tentatively to the variety *acutum* Moore§. From *acutum* it differs in the narrower and more spatulate pinnae, and commonly in the double crenation, for *acutum* is normally with entire, or at most slightly serrulate, pinnae. Mr. Morris states that typical *vulgare* was common in the general region; from this it differs in its much greater size, its scantier foliage, and in the shape of the pinnae. There are in the National Herbarium at least two specimens, collected in West Virginia and North Carolina, which with plants collected at Great Falls, Fairfax County, Va., by William Palmer, are to be regarded as intermediate with typical *vulgare.* Because of these it does not seem best to regard *oreophilum* as entitled to specific rank.

Selaginellaceae.

SELAGINELLA APUS (L.) Spring.

In a luxuriant mass among the grass and shrubs along the edge of an island in the Bluestone River, opposite Delashmeet Creek, Mercer County, altitude 2080 feet, July 27, 1900 (*Morris*, 1061).

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†Bull. 24, W. Va. Exp. Sta., p. 479. 1892.

‡*Polypodium biserratum* M. & G. Mem. Foug. Mex. p. 38. 1842.

‖Fern Bull. **8**: 58. 1900.

§Moore, Nat. Pr. Brit. Ferns, **1**: 63, pl. II, fig. a. 1859.

Spermatophyta.

Pinaceae.

Tsuga Canadensis (L.) Carr.

This species with *Fagus Americana*, *Quercus nigra* and *Quercus alba* form the body of the mountain forests.

Naiadaceae.

POTAMOGETON PECTINATUS L. (Determined by F. V. Coville.)

Forming large masses on the bars of the Greenbrier River at Talcott, Summers County, altitude 1490 feet, August 24, 1900 (*Morris*, 1342).

Vallisneriaceae.

VALLISNERIA SPIRALIS L.

Among the pondweeds in the Greenbrier River at Talcott, Summers County, altitude 1490 feet, August 24, 1900 (*Morris*, 1341).

Gramineae. (Determined by Messrs. Ball and Merrill.)

PASPALUM LAEVE PILOSUM Scribn.

Along Horse and Hound Creeks, near Baileysville, Wyoming County, altitude 1100-1200 feet, August 20, 1900 (*Morris*, 1284).

PANICUM ELONGATUM Pursh.

At the edge of thickets along Horse and Hound Creeks, near Baileysville, Wyoming County, altitude 1100-1200 feet, August 20, 1900 (*Morris*, 1277).

PANICUM COMMUTATUM Schult.

In a woodland near Bargers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 977).

PANICUM POLYANTHES Schult.

Shaded banks of the Guyandot River below Baileysville, Wyoming County, altitude 1100 feet, August 13, 1900 (*Morris*, 1186).

PANICUM NITIDUM Lam.

Along the edge of a meadow at Bargers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 984).

PANICUM BARBULATUM Michx.

Along Dry Fork above Perryville, McDowell County, altitude 1200-1300 feet, August 4, 1900 (*Morris*, 1139); along the Guyandot River below Baileysville, Wyoming County, altitude 1100 feet, August 13, 1900 (*Morris*, 1193).

AGROSTIS CANINA L.

On shaded banks of the Guyandot River below Baileysville, Wyoming County, altitude 1100 feet, August 13, 1900 (*Morris*, 1197).

AGROSTIS CAPILLARIS L.

As the preceding (1197a).

Cyperaceae.

CYPERUS RETROFRACTUS (L.) Torr.

Along the Guyandot River below Baileysville, Wyoming County, altitude 1100 feet, August 18, 1900 (*Morris*, 1236a).

CYPERUS FILICULMIS Vahl.

As the preceding, August 19, 1900 (*Morris*, 1267).

CAREX UTRICULATA Boott.

In a meadow at Bargers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 995).

Melanthaceae.

UVULARIA GRANDIFLORA J. E. Smith.

On a north slope in rich woods along Horsepen Creek between McDowell County, West Virginia, and Tazewell County, Virginia, altitude 1900 feet, July 31, 1900 (*Morris*, 1110).

Betulaceae.

Betula nigra L.

A tree 14′ 2½″ in circumference was measured near Bargers Spring, Summers County.

Fagaceae.

Fagus Americana Sweet.

(See under *Tsuga Canadensis.*)

Castanea pumila (L.) Mill.

A remarkably spreading and symmetrical individual was observed in a pasture at Bargers Spring, Summers County.

Quercus nigra L.

(See under *Tsuga Canadensis.*)

Quercus alba L.

(See under *Tsuga Canadensis.*)

Aristolochiaceae.

ASARUM SHUTTLEWORTHII Britten & Baker f. (Determined by C. L. Pollard.)

In oak and beech woods near Bargers Spring, Summers County, altitude 1550 feet, July 13, 1900 (*Morris*, 980).

Polygonaceae.

POLYGONUM CRISTATUM Engelm. & Gray.

Along the Guyandot River below Baileysville, Wyoming County, altitude 1100-1250 feet, August 19, 1900 (*Morris*, 1255).

Caryophyllaceae.

Silene Virginica L.

Growing on a low roadside bank, fully exposed to the sun, but well supplied with root moisture.

Anychia dichotoma Michx.

Millspaugh & Nuttall say "This species first appeared at this locality in 1895, at the bottom of a newly excavated railroad cut. Had the seeds been buried and dormant?" I should say, no. This species was common with and nearly as abundant as the next throughout the above mentioned counties. It is probable that the newly excavated cut proved, perhaps unusually, suitable for the germination of scattering seeds.

Anychia Canadensis (L.) B. S. P.

Magnoliaceae.

Magnolia tripetala L.

This and the next species form a very conspicuous part of the forests along Dry Fork and Crane Creek in McDowell County, and along the Guyandot River in Wyoming County. A great many young trees are now filling the places made vacant by the cutting of a few selected trees of other species. It is noticeable that until these trees reach the age of flowering and thereafter there is none of the characteristic umbrella-like clustering of the leaves on the axis of the season but they are strongly alternate and distant. This character confuses the species with *Magnolia acuminata* in the young large-leaved stage, unless the smoothness or pubescence of the leaf-buds be noted.

Podostemaceae.

PODOSTEMON CERATOPHYLLUM Michx.

Three well marked stages, (a) an entirely sessile growth on new surfaces, (b) matted growth of previous seasons on old surfaces, with stems an inch or two high, (c) very old masses with stems from five to eight inches high or as long where the current prevented an erect habit; in the Guyandot River below Baileysville, Wyoming County, altitude 1100 feet, August 15, 1900 (*Morris*, 1210).

Crassulaceae.

Penthorum sedoides L.

Very luxuriant specimens three feet and more high were noted in the delta of a spring under limestone cliffs below Baileysville, Wyoming County.

Rosaceae.

Spiraea salicifolia L.

Forming a hedge along a woodland swamp between Harvey and Trap Hill, Raleigh County.

GEUM FLAVUM (Porter) Bicknell.

Along Madam Creek opposite Hinton, Summers County, altitude 1500 feet, July 9, 1900 (*Morris*, 965); along the Guyandot River below Baileysville, Wyoming County, altitude 1250 feet, August 15, 1900 (*Morris*, 1218).

AGRIMONIA HIRSUTA (Muhl.) Bicknell.

In a thicket about a spring near Kegley, Mercer County, altitude 2100 feet, July 21, 1900 (*Morris*, 1042).

Drupaceae.

AMYGDALUS PERSICA L.

Several trees were growing in the woods along Dry Fork above Peeryville, McDowell County, altitude 1300 feet, August 4, 1900 (*Morris*, 1130).

Papilionaceae.

MEIBOMIA PAUCIFLORA (Nutt.) Kuntze.

In woods along Laurel Branch east of Oceana, Wyoming County, altitude 2000 feet, August 22, 1900 (*Morris*, 1291).

Meibomia Dillenii (Darl.) Kuntze.

Locally a very troublesome weed in fields.

Hippocastanaceae.

Æsculus octandra Marsh.

An immense tree of this species, measuring twenty feet in circumference at the ground, twelve feet at the height of one's shoulder, and nearly if not quite one hundred feet high, stood by the bank of Dry Fork above Peeryville, McDowell County.

Violaceae. (Determined by C. L. Pollard.)

VIOLA AFFINIS LeConte.

About a spring near Kegley, Mercer County, altitude 2090 feet, July 21, 1900 (*Morris*, 1046).

VIOLA PAPILIONACEA Pursh.

On Great Bend Tunnel Mountain, Summers County, altitude 1700 feet, July 14, 1900 (*Morris*, 1023); along Horsepen Creek, McDowell County, altitude 1900 feet, July 30, 1900 (*Morris*, 1104).

VIOLA ALSOPHILA Greene.

As the last number (*Morris*, 1101); ditto, altitude 1850 feet, (*Morris*, 1109).

Umbelliferae.

SANICULA TRIFOLIATA Bicknell.

Along Madam Creek opposite Hinton, Summers County, altitude 1500 feet, July 9, 1900 (*Morris*, 961).

Cuscutaceae.

CUSCUTA ARVENSIS Beyrich.

On *Ambrosia artemisiaefolia* in very dry grounds below Baileysville, Wyoming County, altitude 1150 feet, August 13-19, 1900 (*Morris*, 1203a).

Boraginaceae.

MYOSOTIS LAXA Lehm.

About a spring near Kegley, Mercer County, altitude 2090 feet, July 21, 1900 (*Morris*, 1041).

Labiatae.

BLEPHILIA CILIATA (L,) Raf.

On dry banks at Bargers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 999); thickets near Kegley, Mercer County, altitude 2100 feet, July 27, 1900 (*Morris*, 1067).

Solanaceae.

Solanum Carolinense L.

This species and *Verbesina occidentalis* were the commonest weeds throughout the range.

Plantaginaceae.

PLANTAGO ARISTATA Michx.

Previously reported only by State in Bull. Torr. Bot. Club, **27**: 108.

Dry meadows near Bargers Spring, Summers County, altitude 1500 feet, July 13, 1900 (*Morris*, 983).

Campanulaceae.

Campanula divaricata Michx.

Millspaugh & Nuttall mention "the rare Campanula divaricata Mx." among the bell-worts or bellflowers. If the southern counties are to be taken into consideration in rating the occurrence of species in the State, then this species can not be accounted "rare" for the more rocky hillsides throughout are heavily blue-dotted in the Summer with its delicate panicles.

Compositae.

Vernonia gigantea pubescens subsp. nov.

In gross characters like the species. Reaching 10° or over, more or less pubescent. Leaves thin, lanceolate, acuminate, the upper finely, the lower *sharply doubly serrate*, 3′-12′ long, ½′-2½′ wide, *finely pubescent below*, somewhat so above; inflorescence open, its branches rather erect, the peduncles *bracteate for 2′′-5′′ below the heads;* the heads long-peduncled or the centre ones nearly sessile; the bracts greenish purple, acute to short-acuminate, ciliate, erect; corollas light to dark pink, not purple; otherwise as in the species.

Collected among plants of the species along Hound Creek, below Baileysville, Wyoming County, altitude 1100-1200 feet, August 20, 1900 (*Morris*, 1274). Type specimen is deposited in the U. S. National Herbarium.

Eupatorium purpureum L.

Numerous specimens were measured which were over twelve feet high.

SERICOCARPUS LINIFOLIUS (L.) B. S. P.

On dry shaded banks along the road above Hinton, Summers County, altitude 1400 feet, July 7, 1900 (*Morris*, 950).

ASTER CLAYTONI Burgess.

Along rocky banks east of Oceana, Wyoming County, altitude 1300 feet, August 22, 1900 (*Morris*, 1294a).

ASTER SAGITTIFOLIUS Willd.

On dry banks between Piney, Raleigh County, and Jumping Branch, Summers County, altitude 2200-3100 feet, August 24, 1900 (*Morris*, 1338).

GIFOLA GERMANICA (L.) Dumort.

Along the road north of Athens, Mercer County, altitude 2500 feet, July 18, 1900 (*Morris*, 1034).

In preparing this paper the arrangement of the Myxomycetes is according to McBride; the remaining Thallophytes according to Engler & Prantl; the hepatic Bryophytes according to Millspaugh & Nuttall; the true mosses according to Lesquereux & James; the Pteridophytes and Spermatophytes according to Britton & Brown.

Strong heliotropic movements were observed almost daily in various species of *Oxalis*, in *Cercis Canadensis*, *Trofolium dubium* (?), *Vitis cordifolia*, *Robinia hispida* (?), and questionably in *Impatiens aurea*. These species are quoted in the order of those with the greatest movement to those with the least.

Professor C. F. Millspaugh has requested that the following additions be published in this paper, so that the report of species new to West Virginia may be as complete as possible. It is a pleasure to so publish his list.

Fungi.

PERICHAENA FLAVIDA Pk.

On bark of dead *Magnolia Fraseri*, Nuttallburg.—L. W. Nuttall.

ZYGODESMUS TILIACEUS E. & E.

On bark of dead *Magnolia Fraseri*, Nuttallburg.—L. W. Nuttall.

CLADOSPORIUM CORYNITRICHUM E. & E.

On leaves of *Magnolia Fraseri*, Nuttallburg.—L. W. Nuttall.

CLASTERISPORIUM SIGMOIDEUM, E. & E.
Bull. Torr. Club, **26**:472. 1897.

HELMINTHOSPORIUM FUSIFORME Corda.
On old barrel staves, Nuttallburg.—L. W. Nuttall.

FUSARIUM ALEURINUM E. & E.
Bull. Torr. Club, **24**:476. 1897.

FUSARIUM OXYDENDRI E. & E.
Ibid page 477.

PHYLLOSTICTA ALTHAEINA Sacc.
On *Abutilon Avicennae*, Nuttallburg.—L. W. Nuttall.

FUSICOCCUM NERVICOLUM E. & E.
Bull. Torr. Club, **25**:609. 1898.

CYTISPORA TUMULOSA E. & E.
Bull. Torr. Club, **24**:288. 1897.

CYTISPORELLA CARNEA E. & E.
Ibid page 287.

DIPLODIA PARAPHYSATA E. & E.
Ibid page 288.

AECIDIUM ILICINUM E. & E.
Ibid page 284.

SPHAERELLA INFUSCANS E. & E.
Bull. Torr. Club, **25**:504. 1898.

Filices.

ASPLENIUM FILIX-FOEMINA PECTINATUM Wall.
Falls of the Blackwater.—C. F. Millspaugh.

Phanerogamia.

LOLIUM ITALICUM A. Br.
Common on lawns in Fairmont, 1898.—A. Boutlou.

ORNITHOGALUM NUTANS L.
In a ravine above the glass factory north of Morgantown.—A. Boutlou.

POTENTILLA RECTA L.
"I find this plant growing in abundance in a meadow near South Fairmont."—A. Boutlou.

AGRIMONIA BRITTONIANA Bick.
Bull. Torr. Club, **23**:517. 1896.

ROSA SETIGERA Michx.
A common escape about Fairmont.—A. Boutlou.

CRATAEGUS BROWNII Britt.
Bull. N. Y. Bot. Gard., **1**:447. 1900.

KNEIFFIA LONGIPEDICELLATA Small.
Bull. Tor. Club, **23**:178. 1896.

VACCINIUM CONSTABLAEI Gray.
Upshur Co.—W. N. Pollock.

SABBATIA CORYMBOSA Baldw.
Found at West Fairmont.—A. Boutlou.

AMPELANUS ALBIDUS (Nutt.) Britton.
An abundant weed about Charleston.—A. Boutlou.

PHLOX BRITTONII Small.
Bull, Torr. Club, **27**:279. 1900.

MEEHANIA CORDATA (Nutt.) Britton.
Upshur Co.—W. N. Pollock.

PLANTAGO ARISTATA Michx.
Plentiful near Farmington.—A. Boutlou. (Mr. Boutlou's specimens are those referred to in the citation under *P. aristata* above. [E. L. M.])

VERNONIA MAXIMA Small.
Bull. Torr. Club, **27**:280. 1900.

SOLIDAGO NEGLECTA T. & G,
Upshur Co.—W. N. Pollock.

ASTER NOVAE-ANGLIAE L.
Near Palatine, and near Fairmont.—A. Boutlou.

ANTENNARIA PROPINQUA Greene.
Pittonia, **4**:83. 1899.

BIDENS MELANOCARPA Wieg.
Bull. Torr. Club, **26**:407. 1899.

Department of Biology, Washington High Schools.

VOL. XIII, PP. 183-184 NOVEMBER 30, 1900

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

New name for a North American Squirrel.

In 1894 I described a subspecies of Abert's squirrel under the name of *Sciurus aberti concolor.** My attention has recently been called to the fact that an Asiatic squirrel was given the specific name *concolor* by Blyth in 1855.† In order to prevent confusion I would propose that the sub-specific name of the American animal be changed to *ferreus.*—*F. W. True.*

The proper name of the Viscacha.

In 1897 Dr. T. S. Palmer (*Science,* N. S., VI, No. 131, pp. 21, 22, July 2, 1897) called attention to the fact that the then current generic name of the Viscacha, *Lagostomus* Brookes (1828) was antedated by *Vizcacia* Schinz (*circa* 1825), and that the specific name *trichodactylus* Brookes (1828) was antedated by *maximus* (*Dipus maximus* Desmarest, ex Blainville, Ms., 1817,) and therefore claimed that the proper name of the Viscacha was "*Vizcacia maxima* (*Blainville*)." Recently Mr. James A. G. Rehn (Proc. Biol. Soc. Wash., XIII, p. 166, Oct. 31, 1900) states that the specific name *maxima* is antedated by *Lepus viscaccica* Brandis (Versuch einer Naturgeschichte von Chili, 1786, p. 272), overlooking the fact that this latter name originated with Molina, it appearing in the first (1782) edition of his 'Saggio sulla Storia Naturale del Chili,' p. 342, as *Lepus viscacia.* The name of the Viscacha should therefore be *Vizcacia viscacia* (Molina). The authority for the specific name is hence Molina and not Brandis, and the name itself takes the form *viscacia* instead of *viscaccica.*—*J. A. Allen.*

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*Proc. U. S. Nat. Mus., 17, 1894, No. 999, pp. (advance sheet issued April 26, 1894).

†Jour. Asiatic Soc. Bengal, new series, 24, No. 5, 1855, p. 474, footnote.

A new Helianthus from Florida.*

Helianthus agrestis Pollard, n. sp.

Annual, rather freely branching, about one meter in height; stem many-striate or even sulcate, for the most part quite glabrous; peduncles slender, 1-flowered, hoary-pubescent near the heads, the pubescence gradually thinning below to a few scattered hairs; lower cauline leaves lanceolate, acuminate, 1.5 dm. long, tapering below to a short margined petiole, the margins remotely denticulate, hispid with short bristly hairs; blade with a prominent central nerve and two laterals springing from some distance above the base, both surfaces glabrous except along the primary nerve beneath; heads 5 to 6 cm. in diameter, the rays about 10 to 12, bright orange-yellow; involucral bracts lanceolate, attenuate, slightly scabrous, the margins sparsely ciliate; achenes narrowly oblong.

Type in the United States National Herbarium, Smithsonian Institution, (sheets Nos. 370175 and 370176) collected on shelly land between Lake Beresford and the St. Johns River, Volusia County, Florida, July 12, 1900, by A. H. Curtiss. The collector observes that the plant is tender and rather succulent, an unusual character among the species of Helianthus.

The new species had been previously collected by A. P. Garber in Levy and Manatee Counties in 1877. Mr. Merritt L. Fernald, of the Gray Herbarium, who had independently reached the conclusion that the plant was undescribed, courteously placed at my disposal the notes he had prepared, from which I quote the following: "Mr. Garber's plant was included by Dr. Gray in his *H. Floridanus*, but it is very distinct from that perennial species, which must rest upon Palmer's plant No. 283 of the 1874 collection, first cited by Dr. Gray,—a plant well matched by other specimens from Chapman and Curtiss, No. 1437."—*Charles Louis Pollard.*

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VOL. XIII, PP. 185-186 DECEMBER 21, 1900

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW MOUSE DEER FROM LOWER SIAM.*

BY GERRIT S. MILLER, JR.

The large *Tragulus* of the *napu* type inhabiting Trong, Lower Siam, differs notably from the Sumatran animal as described by F. Cuvier and as represented by a specimen from Linga Island, off the east coast of Sumatra. As none of the names based on continental specimens appear to be applicable to it, the species may be known as:

Tragulus canescens sp. nov.

Type.—Adult female (skin and skull) No. 83,509, United States National Museum. Collected in Trong, Lower Siam, September 7, 1896 by Dr. W. L. Abbott.

Characters.—Larger than *Tragulus napu* and much paler, less yellow in color; chest and belly entirely white, or at most the former very faintly shaded with gray along median line; sides clear gray; dark nape band obsolete.

Color.—Back orange-buff heavily clouded with blackish brown, but latter color never in excess of former. On sides the orange-buff fades abruptly through cream-buff to nearly white, producing with the blackish tips of the hairs a clear gray, faintly yellowish, strongly contrasted with color of back. Flanks more tinged with buff than sides. Harsh fur of shoulders, neck and nape irregularly and coarsely grizzled with cream-buff and blackish brown, the latter slightly in excess on nape, but not forming a distinct median stripe. Upper surface of head and face essentially like back. A faint, diffuse, pale streak over and in front of eye. Sides of neck slightly paler than nape. Throat with the usual dark and white bands, all of which are of approximately equal breadth. The dark bands are darker than the neck, but not conspicuously so. They are coarsely grizzled with buff and blackish brown, the latter color in excess. Collar like sides, therefore paler than longitudinal throat bands. Chest, belly and inner side of legs white, the chest faintly shaded with gray along median line. Outer surface of legs clear orange-buff, somewhat brighter than that of back. Tail white beneath, orange-buff faintly clouded with blackish brown above.

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Skull and teeth.—In size and general form the skull of *Tragulus canescens* closely resembles that of *T. napu*. It is at once distinguishable, however, by the larger audital bullæ and much larger teeth. When the skulls are viewed from behind, held so that the tips of the premaxillaries fall in line with the anterior rim of the foramen magnum the visible surface of each audital bulla is reduced in *Tragulus napu* to a mere rim much less extensive than that of the occipital condyle, while in *T. canescens* the bulla appears considerably larger than the condyle. The actual difference in size is about as follows: *Tragulus napu;* greatest length of bulla, 23; greatest width, 12.4; *Tragulus canescens;* greatest length of bulla, 25; greatest width, 14. Though not different in form, the teeth of *Tragulus canescens* are uniformly larger than those of *T. napu*, so that each toothrow is about 5 mm. longer.

Measurements.—External measurements of type: total length, 648; head and body, 559 (553*); tail vertebræ, 89; hind foot, 152 (120); hind foot without hoof, 136 (105); ear from meatus, 37 (34); ear from crown, 35 (30); width of ear, 21 (22).

Cranial measurements of type: greatest length 115 (114*); basal length, 110 (106); basilar length, 103 (99); occipito-nasal length, 104 (104); length of nasals, 36.4 (34); diastema, 14 (15); zygomatic breadth, 50 (48); least interorbital breadth, 31 (30); mandible, 90 (90); maxillary toothrow (alveoli), 40 (34); mandibular toothrow (alveoli), 46 (39.6).

Weight.—Weight of type, 5.33 kg. Weight of a second specimen (adult female), 5 kg.

Specimens examined.—Three, all from the type locality.

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*Measurements in parenthesis are those of an adult female *Tragulus napu* from Linga Island.

VOL. XIII, PP. 187-193 DECEMBER 21, 1900

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

MAMMALS COLLECTED BY DR. W. L. ABBOTT ON PULO LANKAWI AND THE BUTANG ISLANDS.*

BY GERRIT S. MILLER, JR.

The first half of December, 1899 Dr. W. L. Abbott spent in exploring Pulo Lankawi and the Butang Islands. Pulo Lankawi, or as it stands on some maps, Langkawi, or Lancava, and the Butang or Buton Islands are situated near the west coast of the Malay Peninsula at the northern extremity of the Straits of Malacca, about 75 miles north of Penang. Lankawi is separated from the mainland by ten miles or more of water, the Butangs by a space about double as great. The distance from the western end of Lankawi to the Butang group is about fifteen miles in a northwesterly direction, The collection of mammals, numbering about eighty specimens, all of which have been presented to the United States National Museum, represents thirteen species, of which all are closely related to those of the adjacent mainland.

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Mus vociferans lancavensis subsp. nov.

Type.—Adult female (skin and skull), No. 104,173 United States National Museum. Collected on Pulo Lankawi, December 6, 1899. Original number 122.

Characters.—Not as large as *Mus vociferans vociferans* from Trong, Lower Siam; color more conspicuously ochraceous; tail with less brown on dorsal surface; skull with median portion of parietals more elevated above general outline of braincase.

Color.—The color so closely resembles that of true *Mus vociferans* that no detailed description is necessary. When series of specimens are compared, however, it is at once seen that those from Pulo Lankawi are distinctly more yellow than those from the type locality of the species. The difference is due in part to a slight reduction in the number of dark hairs on the back in the insular animal, but to a certain extent also to a change in the ochraceous ground color. The latter, particularly on the cheeks, flanks, and outer side of thighs, is visibly though faintly more yellow than in the Trong specimens. Underparts cream-buff. Tail whitish above and below distally, bicolor at base. The brown dorsal area scarcely reaches middle of tail, while in true *Mus vociferans* it extends beyond middle and often nearly to tip.

Skull and teeth.—In size and general form the skull agrees with that of *Mus vociferans vociferans*, but when viewed from the side a slight though very constant difference in the form of the braincase becomes apparent. In both animals the middle portion of the parietals is convex, rising as a distinct though low prominence above the level of the interparietal and that of the frontals. This convexity is so exaggerated in *Mus vociferans lancavensis* that skulls are easily recognized either by sight or touch.

Teeth similar to those of true *Mus vociferans*.

Measurements.—External measurements of type: total length, 520; head and body, 209*; tail vertebræ, 311*; hind foot, 45; hind foot without claws, 42. Average of five specimens, including the type: total length, 543 (520-559); head and body, 222 (209-229); tail vertebræ, 321 (311-330); hind foot, 46 (45-47); hind foot without claws, 43 (42-44).

Specimens examined.—Five skins and nine skulls, all from the type locality.

Remarks.—While this insular race is distinguished from true *Mus vociferans* by no one constant character the sum of its peculiarities are enough to make it readily distinguishable. The slight difference in size is chiefly due to the shorter tail of the insular form.†

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*Collector's measurement.

†In seven topotypes of *Mus vociferans* the tail averages 342 mm., with extremes of 323 mm. and 380 mm.

Mus surifer flavidulus subsp. nov.

Type.—Adult female (skin and skull), No. 104,330 United States National Museum. Collected on Pulo Lankawi, December 4, 1899. Original number 109.

Characters.—Smaller than *Mus surifer surifer* from Trong, Lower Siam; tail usually a little shorter than head and body; ground color of sides and upper parts yellower (less tawney) than in the mainland form, and dark shading less conspicuous; belly cream-buff instead of white; skull smaller than that of the typical race, the braincase smaller and less ridged.

Color.—The color is as in true *Mus surifer* except that throughout the pelage there is a stronger tendency to yellowish tints. Ground color of sides and back light orange-buff, rarely as deep as in the Trong animal, which often approaches tawny-ochraceous. Underparts pale cream-buff or yellowish white. The dark brown hairs of the upperparts are distributed as in *Mus surifer surifer;* but they appear to be fewer in number. Feet and tail as in the mainland animal, the latter sharply bicolor nearly to tip, its distal extremity whitish above and below.

Skull and teeth.—Skull distinctly smaller than that of *Mus surifer*, and in general of much the same form. The braincase is, however, broader in proportion to the lĕngth of the skull, and the supraorbital ridges are less conspicuously developed. The interparietal is similar to that of the mainland animal and does not approach the peculiar triangular form found in the representative of the species occurring on the Butang Islands.

Teeth as in typical *Mus surifer*.

Measurements.—External measurements of type: total length, 355; head and body, 197; tail vertebræ, 158; hind foot, 37.6: hind foot without claws, 36. Average of ten specimens including the type: total length, 335 (305-369); head and body, 175 (159-197); tail vertebræ, 160 (146-172); hind foot, 39 (37-42): hind foot without claws, 37 (36-40).

Cranial measurements of type: greatest length, 44; basal length, 37; basilar length, 34.8; palatal length, 18; least width of palate between anterior molars, 5; diastema, 12.6; length of incisive foramen, 6.4; combined breadth of incisive foramina, 3.6; length of nasals, 17; combined breadth of nasals, 5; zygomatic breadth, 20; interorbital breadth, 7; mastoid breadth, 15; breadth of braincase above roots of zygomata, 17; depth of braincase at front of basioccipital, 11; frontopalatal depth at posterior extremity of nasals, 10; least depth of rostrum immediately behind incisors, 7.8; maxillary toothrow (alveoli), 6.8; width of front upper molar, 2.2; mandible, 23.6; mandibular molar series (alveoli), 6.6.

Specimens examined.—Thirteen skins, twenty skulls, and one specimen in alcohol, all from Pulo Lankawi.

Remarks.—By its small size and yellowish color this race is readily distinguishable from that of the mainland as well as from that of the nearby Butang Islands.

Mus surifer butangensis subsp. nov.

Type.—Adult male (skin and skull) No. 104,309 United States National Museum. Collected on Pulo Adang, Butang Islands, December 16, 1899. Original number 157.

Characters.—More robust than *Mus surifer surifer* from Trong, Lower Siam; tail distinctly shorter than head and body: ground color of sides and upper parts darker and less bright than in the mainland form, and dark shading more diffuse; belly dirty buff; skull with the rostrum deeper, the braincase relatively narrower and more ridged, and the interparietal more distinctly triangular in outline.

Color.—The color differs from that of the typical race in the dullness of the fulvous tints. These are very nearly ochraceous-buff in marked contrast with the orange-buff of *Mus surifer surifer* and *M. surifer flavidulus.* The sprinkling of blackish hairs in very diffuse, adding to the peculiar aspect of the animal. Underparts soiled cream-buff. Tail and feet as in the related forms.

Skull and teeth.—The skull, while not actually larger than in the mainland race is more angular and heavily ridged. The rostrum when viewed from the side is distinctly deeper and the braincase appears to be slightly narrower, though the latter character is not very well marked. The outline of the interparietal is nearly a perfect isosceles triangle the base of which (the anterior edge) is about one and one half times as long as either side. Teeth as in typical *Mus surifer.*

Measurements.—External measurements of type: total length, 374; head and body, 203; tail vertebræ, 171; hind foot, 43; hind foot without claws, 41. Average of twelve specimens from the type locality: total length, 353 (311-381); head and body, 194 (178-210); tail vertebræ, 159 (133-171); hind foot, 41 (38.5-43); hind foot without claws, 38 (37-41). Average of three specimens from Pulo Rawi; total length, 353 (336-356); head and body, 192 (184-203); tail vertebræ, 160 (152-165); hind foot, 39 (38.5-40); hind foot without claws, 36.8 (36.5-37).

Specimens examined.—Fifteen; twelve from Pulo Adang, and three from Pulo Rawi, Butang Islands.

Remarks.—The three skins from Pulo Rawi agree very closely with those from the type locality though in color they are slightly less dull.

Mus pannosus sp. nov.

Type.—Adult male No. 104,110 United States National Museum. Collected on Pulo Adang, Butang Islands, December 14, 1899. Original number 146.

Characters.—Similar to *Mus tambelanicus* Miller, but with larger ears, pelage of upper parts less suffused with red, and entire underparts grizzled with gray. Audital bullæ larger than in *Mus tambelanicus.*

Color.—Back a rather coarse grizzle of light wood-brown and blackish brown the two colors mixed in nearly equal proportions. Sides very dull buff-yellow heavily sprinkled with dark brown. Ventral surface dull, pale, buff, strongly suffused with drab-gray, particularly along median line. Chin and throat usually dull buffy white scarcely tinged with gray.

Skull.—The skull is similar to that of *Mus tambelanicus* except that the audital bullæ are very noticeably larger and less depressed on the outer side. Teeth as in *Mus tambelanicus*, that is, like those of *Mus* '*alexandrinus*', only larger.

Measurements.—External measurements of type: total length, 406; head and body, 203; tail vertebræ, 203; hind foot, 41; hind foot without claws, 38. Average of seven specimens from the type locality: total length, 386 (373-406); head and body, 196 (184-203); tail vertebræ, 190 (184-203); hind foot, 40 (38-41.5); hind foot without claws, 38 (35-39). An adult male from Pulo Rawi measures: total length, 409; head and body, 203; tail vertebræ, 196; hind foot, 39; hind foot without claws, 36.

Specimens examined.— Ten (three in alcohol) from Pulo Adang, and three from Pulo Rawi, Butang Islands.

Remarks.—The close resemblance of this species to *Mus tambelanicus*, and its unlikeness to the small *Mus* '*alexandrinus*' of the adjacent mainland suggest that the two large animals are less closely related to the latter than I at first supposed *Mus tambelanicus* to be. While of the same general form as the roof rat they are heavier animals with coarser more shaggy fur.

Mus cremoriventer subsp. ?

Two specimens (one in alcohol) from Pulo Lankawi and a third from Pulo Adang differ from true *Mus cremoriventer* in a strong yellowish suffusion of the entire pelage. As they were taken at practically the same season as the original specimens of *M. cremoriventer* there is little probability that the differences are due to individual variation. Without further material, and particularly in the absence of series of the yellowish *Mus flaviventer* from the Anambas, it seems unwise to attempt to define the present race.

Ratufa melanopepla Miller.

One specimen, Pulo Lankawi, December 9, 1899.

Sciurus concolor Blyth.

Two specimens from Pulo Lankawi and three from Pulo Adang. They agree in all essential characters with skins from Trong, Lower Siam, but whether the same as the true *concolor* of Malacca it is at present impossible to determine.

Tragulus umbrinus sp. nov.

Type.—Adult male (skin and skull) No. 104,414, United States National Museum. Collected on Pulo Lankawi, December 7, 1899. Original number, 134.

Characters.—Similar to *Tragulus canescens** of the adjacent mainland, but smaller in size and much darker in color. Throat stripes blackish brown with scarcely a trace of pale speckling. Belly heavily washed with fulvous gray.

Color.—Ground color of back a deeper, brighter orange-buff than in *T. canescens* and blackish clouding much in excess of buff. Sides and flanks as in the mainland animal but conspicuously darker, owing to the greater admixture of brown. Entire neck from crown to shoulders, and laterally to outer white throat stripes, blackish seal-brown, many of the hairs with a subterminal orange-buff area about 3 mm. in length. The buff rings give the dark area a speckled appearance, but they are not sufficiently numerous to produce grizzling, except occasionally at the sides of the neck. Upper surface of head and face slightly darker than back; cheeks and ill defined streak over and in front of eye paler. *Lateral dark throat stripes clear blackish seal-brown scarcely speckled with buff.* Collar like sides of body, only more finely grizzled. Chest and posterior half of belly white, the intermediate region heavily clouded with yellowish gray, darker and clearer along median line. Outer surface of legs dull ochraceous somewhat clouded with dark brown.

Skull and teeth.—Skull as in *Tragulus canescens*, but slightly smaller. Relative size of teeth as in the mainland animal, therefore considerably greater than in *T. napu*.

Measurements.—External measurements of type: total length, 596; head and body, 520; tail vertebræ, 76; hind foot, 135; hind foot without hoof, 123; ear from meatus, 34; width of ear, 22. External measurements of a second adult male from the type locality; total length, 584; head and body, 508; tail vertebræ, 76; hind foot, 128; hind foot without hoof, 115.

Cranial measurements of type: greatest length, 112; basal length, 108; basilar length, 100; zygomatic breadth, 48; mandible, 90; maxillary toothrow (alveoli), 30; mandibular toothrow (alveoli), 47.

Weight.—Weight of type 3.63 kg. Weight of second adult, 3.4 kg.

Specimens examined.—Three, all from the type locality.

Tragulus javanicus (Gmelin).

Thirteen specimens from Pulo Lankawi and two from Pulo Ádang are indistinguishable from those taken on the mainland.

Lutra barang F. Cuvier.

One adult female, Pulo Lankawi, December 10, 1899. Measurements: total length, 1090: head and body, 673; tail vertebræ, 419; hind foot, 128.

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*See *antea*, p. 185.

Tupaia ferruginea Raffles.

Two specimens from Pulo Lankawi and one each from Pulo Adang and Pulo Rawi are indistinguishable from those taken in Trong, Lower Siam.

Galeopithecus volans (Linnæus).

Two specimens, both from Pulo Adang.

Emballonura peninsularis Miller.

Nine specimens (one skin), Pulo Rawi, Butang Islands, December 19, 1899.

Semnopithecus obscurus Blyth.

Two were taken on Pulo Lankawi, December 5, 1899.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

RIBES MESCALERIUM, AN UNDESCRIBED CURRANT FROM NEW MEXICO AND TEXAS.

BY FREDERICK V. COVILLE.

Dr. Valery Havard, in his report on the Flora of Western and Southern Texas, identified one of his plants as *Ribes viscosissimum* Pursh, and wrote of it as "the only gooseberry seen in western Texas, growing sparingly in the Guadalupe Mountains."* On the basis of the same observations Dr. John M. Coulter included *viscosissimum* in his Botany of Western Texas, commenting on it as occurring "sparingly in the mountains west of the Pecos, and apparently the only gooseberry of western Texas."† Dr. Havard's specimen, which is in the National Herbarium, was collected in the Guadalupe Mountains, El Paso County, Texas, in October, 1881. It has neither flowers nor fruit, and has long been a puzzle on account of its peculiar vegetative characters, intermediate between those of *viscosissimum* and *cereum*. In Professor Coulter's description the flower and fruit characters were of course drawn from Rocky Mountain specimens of typical *viscosissimum*, so that the Texas plant has really never been described, nor does any good material of it seem to have been collected.

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*Havard, Proc. U. S. Nat. Mus. **8**: 524. 1885.

†Contr. U. S. Nat. Herb. **2**: 109. 1891.

In 1897 Professor E. O. Wooten collected in the White Mountains of Lincoln County, New Mexico, a currant which he distributed with a mark of doubt as *Ribes cereum* Dougl., No. 281 of his collection of that year. The specimen was remarkable in being black-fruited, the fruit of *cereum* being invariably of a light red color. Concluding that this represented an undescribed species I wrote, early last spring, to Professor Wooten, who courteously loaned me his collection of New Mexican Ribes. Among these was another fruiting specimen of the new currant, from the Sacramento Mountains, and a fragmentary flowering specimen from the White Mountains.

As Mr. Vernon Bailey, of the Biological Survey, expected to visit southeastern New Mexico during the summer I requested him to look out for this currant, and he has lately handed me some fine flowering specimens of it from the Sacramento Mountains. From all this material the following description has been drawn.

Ribes mescalerium sp. nov.

Erect shrub, without spines or prickles; one-year-old twigs cream to buff-colored, glandular-hairy, the epidermis on older branches soon splitting and weathering away, leaving the branches chestnut brown often overlaid with some thin grayish tissue; leaf-blades roughly orbicular in outline, usually broader than long, 1.5 to 2.5 or sometimes even 3.5 cm. wide, truncate, broadly wedge-shaped, or somewhat cordate at base, 3 to 5-lobed, the lobes unevenly crenate-dentate, or even indistinctly lobulate, with gland-tipped hairs on both surfaces, and on the lower surface some glandless pubescence also: petioles usually a little shorter than the blades, closely pubescent and with a few larger gland-tipped hairs; racemes short, almost capitate, closely 2 to 4 or sometimes even 6-flowered, the glandular-hairy and pubescent deflexed peduncle commonly 8 to 15 mm. in length; bracts obovate, sessile, toothed toward the apex, glandular-hairy, 3 to 5 or sometimes even 7 mm. long; flowers sessile or nearly so, the usually very short pedicels glandular-hairy and pubescent; ovary glandular-hairy; tube of calyx (moist) about 5 to 6 mm. long and 3.5 broad, sparingly glandular-hairy, greenish white, the reflexed ovate-oblong lobes broadly acute or obtuse, 2 to 3 mm. long, pubescent on the outside toward the apex; petals white, rotund, about 2 mm. long; stamens with filaments adhering to the calyx tube as far as the throat, the free portion shorter than the anther, this when expanded about 1 mm. in breadth and length; style stout, smooth, shortly two-lobed at the slightly exserted apex: fruit spherical, black, without bloom, sparingly glandular-hairy, 5 to 8 mm. in diameter in dried specimens, the flattened ones sometimes even 10 mm.

Type specimen in the United States National Herbarium, collected July 21, 1899, in the Sacramento Mountains, at Fresnal, Otero County, New Mexico, at an altitude of 7,200 feet, by E. O. Wooten.

So far as known *Ribes mescalerium* is confined to the White and Sacramento Mountains of Lincoln and Otero counties, New Mexico, and the neighboring Guadalupe Mountains which extend across the State line into El Paso County, Texas. The specimens have been collected at altitudes varying from 7,000 to 9,000 feet. Mr. Bailey considers it a plant of the Canadian zone. The flowering specimens are dated May 11 and June 1, and the fruiting specimens July 21 and August 5. Dr. Havard's designation of this currant as a gooseberry was probably based chiefly on the paucity of the fruits in the raceme, a character possessed also by *Ribes cereum.* Although these and other species of the *cereum-viscosissimum-sanguineum* group, in some of which the racemes are many-flowered, have a well-defined calyx tube like the gooseberries, none of them bear spines or prickles on the branches and they are thus easily separable from the true gooseberries.

From *Ribes cereum* our plant is distinguishable in the herbarium by the stalked character of the glands on the leaves and young twigs, by the relatively broader calyx tube, its ratio of breadth to length being about 1 to 1¼ or 1¾, and by its black fruit. *Ribes cereum* has the glands on its leaves and young twigs almost always sessile, a corolla tube with the ratio of breadth to length about 1 to 2½ or 3½, and a fruit of bright red color. With *viscosissimum* the new species agrees in the stalked character of the glands on the vegetative parts of the plant, and in the black color of the fruit, but the leaves, flowers, and fruit of *viscosissimum* are much larger, the flowers being about 15 mm. long when the calyx lobes are not reflexed, and the tube about 6 mm. broad, while the pedicels are several millimeters, often 1 cm. or more, in length, and the elliptical-oblong fruit is commonly 8 to 10 mm. broad by 10 to 12 mm. long. The oblong anthers of *viscosissimum*, commonly 1.5 mm. in length, in all the specimens examined, are exceeded by the free portion of the filament. Mr. Bailey states that the bushes are taller than those of *cereum*, being commonly 4 to 6 feet high, and do not spread out into the broadly rounded and closely branched form common in *cereum.* *Viscosissimum* is ordinarily a few-branched straggling shrub 2 to 4 feet high.

The name selected for the species, *mescalerium*, commemorates the Mescalero Apaches, a tribe of Indians who in former times inhabited the region in which the plant occurs and who now occupy a reservation in the White Mountains of Lincoln County, New Mexico.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

POLYPODIUM HESPERIUM, A NEW FERN FROM WESTERN NORTH AMERICA.*

BY WILLIAM R. MAXON.

The prospect before one attempting to bring anything like order out of the substantial aggregate known as *Polypodium vulgare* is far from encouraging. Much uncertainty exists even as to the typical form of the species, and it is certainly to be doubted whether the common form of the eastern United States truly represents the species long ago characterized upon European material as *vulgare.* At one time Hooker regarded our eastern representative of varietal rank and briefly characterized it as var. *Americanum;*† but he seems to have disregarded it in his later work. Much confusion has arisen also as to the identity of his var. *occidentale*† founded upon specimens collected at the mouth of the Columbia and at Sitka. So far as the description goes it applies well to the plant later described by Kellogg as *P. falcatum*‡ and again by Eaton as *P. glycyrrhiza,*§ but it may with equal propriety be referred to another form of the Pacific coast especially abundant in Alaska and the Aleutian Islands which is rather coriaceous in texture and in some cases serrated as the variety was originally described. Be that as it may, the species here described as new is clearly not closely related to either of Hooker's "varieties." It comprises the common form of the whole mountain-region of the western United States, and is essentially different from the material of eastern North America. I propose the name:

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†Flora Bor. Am. **2** : 258. 1840.

‡Proc. Cad. Acad. Sci. I, **1** : 20. 1854.

§Am. Journ. Sci. II, **22** : 138. 1856.

Polypodium hesperium.

Rhizome rather stout, firm, creeping, chaffy with dark brown scales; fronds 4 to 13 inches long, clustered; stipe 1 to 5 inches long, smooth, decidedly stramineous; lamina 3 to 8 inches long, 1 to 1¾ inches broad, linear-oblong, apical portion usually entire and acuminate, texture thinner than in *vulgare*, the under surface sparsely glandular; pinnae mostly alternate, 6″ to 10″ long, 3″ to 5″ broad, elliptical or somewhat spatulate, always narrowest at base, broadly rounded at tip; margins obscurely (or, less often, decidedly) crenate; veins forking two or usually three times, veinlets free; sori very large, oval, borne midway between the midvein and margin, at the end of the lowermost veinlet; spores greenish-yellow, smoothish.

Type specimen, No. 303,284 in the U. S. National Herbarium, Smithsonian Institution, collected by M. W. Gorman, No. 642, August 21, 1897, in Coyote Cañon, Lake Chelan, Washington. The geographical distribution of the species embraces the territory from the Rincon and San Francisco Mountains in Arizona to Washington and British Columbia, Idaho and Montana. Within this region *vulgare* does not occur.

It is doubtful whether *hesperium* is very closely related to the eastern *vulgare*. Its affinities seem rather to lie with the Polypodiums of the Pacific coast, one especially notable feature which it possesses in common with them being the hard licorice-like rootstock. The rhizomes of the eastern *vulgare*, on the other hand, are not only spongy and quite acrid but more or less unsavory in taste. The chaff of *hesperium* too is very much darker than that of the material of the eastern United States and the stipes are much more thickly clustered. The most prominent feature is the very characteristic shape of the pinnae, often half as broad as long.

The name is chosen in allusion to the occurrence of the species in western North America. It is barely possible, but hardly probable, that the species here described is identical with the var. *rotundatum* of Milde, which is however antedated by the *Polypodium rotundatum* of Sieber, applied to a West Indian species.

Nearly fifty specimens of this species have been examined, from the herbaria of the National Museum, Yale University, the California Academy of Sciences, Professor L. M. Underwood, Mr. B. D. Gilbert, and Mr. J. B. Flett. I desire to express my thanks to the curators of the public herbaria and to the gentlemen above mentioned, especially to Mr. Flett who has furnished an excellent suite of specimens from Washington, ranging from altitudes of 3600 to 5500 feet.

U. S. National Museum, Washington, D. C.

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